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S. HRG. 101-620

TAX INCENTIVES TO BOOST ENERGY EXPLORATION

HEARING

BEFORE THE

SUBCOMMITTEE ON
ENERGY AND AGRICULTURAL TAXATION

OF THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST SESSION

ON

S. 828

AUGUST 3, 1989

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TAX INCENTIVES TO BOOST ENERGY EXPLORATION

THURSDAY, AUGUST 3, 1989

U.S. SENATE,
SUBCOMMITTEE ON ENERGY AND AGRICULTURAL TAXATION,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 2:00 p.m., in room SD-215, Dirksen Senate Office Building, Hon. David L. Boren (chairman of the subcommittee) presiding.

[The press release announcing the hearing follows:]

[Press Release No. H-46, July 28, 1989]

HEARING PLANNED ON ENHANCED OIL RECOVERY TECHNIQUES SUBCOMMITTEE TO LOOK AT TAX INCENTIVES TO BOOST ENERGY EXPLORATION

WASHINGTON, DC—Senator David L. Boren (D., Oklahoma), Chairman, Subcommittee on Energy and Agricultural Taxation, announced Friday that the Subcommittee will hold a hearing on a bill to provide tax incentives designed to boost domestic energy exploration.

The hearing is scheduled for *Thursday, August 3, 1989 at 2 p.m.* in Room SD-215 of the Dirksen Senate Office Building.

The hearing will be on the Enhanced Oil Recovery Act of 1989 (S. 828), sponsored by Senators Pete Domenici (R., Ariz.) and Boren. The bill would provide incentives for the removal of crude oil and natural gas through enhanced oil recovery techniques.

"Enhanced oil recovery technology is the opportunity we have been waiting for to boost the prospects for the next generation of oil producers," Boren said.

"Billions of barrels of oil already have been discovered but will remain forever wasted unless we can provide the incentives necessary to recover these resources," Boren said.

OPENING STATEMENT OF HON. DAVID L. BOREN, A U.S. SENATOR FROM OKLAHOMA

Senator BOREN. We will begin the hearing at this point. We welcome all of you to this hearing. We are here today to discuss proposals to increase domestic production of oil and gas with the use of enhanced oil recovery methods. With the level of imported crude oil and refined petroleum products rapidly approaching 50 percent of our consumption, it is vitally important that we consider every possible alternative to increase our domestic production. With the rig count for this Nation falling below 900 active rigs, it is extremely important that we encourage additional exploration to increase our dwindling reserves.

The enhanced Oil and Gas Recovery Tax Act of 1989 S. 828 attempts to address those concerns by focusing on a potential for in-

creased production through the use of enhanced oil recovery technologies. Specifically, this legislation would (1) increase the percentage of depletion rate for domestic oil and gas recovered through EOR to 27.5 percent; (2) increase the net income limitation on percentage depletion deductions from this production from 50 percent to 100 percent; (3) the alternative minimum tax preferences for percentage depletion and intangible drilling costs (IDC's) would not apply to the deductions attributable to this increased enhanced oil recovery production; and (4) a 10 percent research and development tax credit would apply to research to discover or improve tertiary recovery methods.

We will hear testimony today suggesting that with proper incentives we can significantly increase our domestic production. It is important to understand that this is not the production of new reserves, but rather the production from existing reserves that previously were not recoverable. Almost one-half of all the oil ever discovered in the continental United States is still in the ground. We know where the reserves are. We simply have to find a way to get them out of the ground. Every barrel of enhanced recovery oil produced from existing reserves means one less barrel of imported oil that must be transported into the United States by tanker.

Every barrel of additional oil that we can bring up domestically means one less barrel of imported oil that would add to our growing trade deficit. Also, I would add, add to the national security threat as we become dependent to an unhealthy degree on foreign sources.

I have long been concerned about our declining rate of domestic production. The rig count has fallen over 82 percent since 1982. In my home State, the Oklahoma production has declined during a two-year period over 30 million barrels. It is long past time to take action.

The proposal before us today is just a first step toward what I hope will become a national energy policy. It is one of the most cost effective proposals that I have ever seen presented to the Congress since I have been here to encourage more domestic production, to get more of that oil out of the ground, oil for which the environmental costs have already been paid, oil that should be now at the service of the American people.

Let me add that I am especially pleased that this administration has made specific proposals to address our long-standing concerns and I remain optimistic that we will be able to find a significant common ground. Very soon the Secretary of Energy will be holding hearings around the country concerning the development of a national energy policy. We have been getting along in this country far too long without a national energy policy and the absence of a sound policy has done irreparable damage, not only to our economy—the economy of States like mine and regions like mine—but I think the entire national economy and certainly the national security interests.

So I want to commend especially Senator Domenici here today. I am proud to join with him in sponsoring this legislation. I want to commend you, Senator Domenici, for being the author, the principal author of this legislation, for bringing forward a proposal that with very, very little cost in terms of lost revenues in the short

run, and will generate very, very large increase in recoverable oil, domestic production and I am convinced in the long run will stimulate and will actually bring about increased revenues to the Treasury through stimulated economic activity here at home.

So it is an important proposal, one that I strongly feel should be and must be a part of any national energy plan. It is also a proposal that has such modest impact on revenues in the first couple of years that I am hopeful that when reconciliation is considered by the Finance Committee that we will find a way to no longer delay, but to take action this year on a sound and solid proposal like this and begin to take steps in the right direction.

We are very pleased to have as our first witness Senator Peter Domenici, a U.S. Senator from New Mexico, who has contributed so much to our understanding of this issue and I think has made a great contribution in framing this legislation.

Senator Domenici, we would be very happy to hear from you at this time.

STATEMENT OF HON. PETE V. DOMENICI, A U.S. SENATOR FROM NEW MEXICO

Senator DOMENICI. Thank you very much, Mr. Chairman. First, let me thank you for cosponsoring this legislation and taking the lead on the Committee of Jurisdiction. I am very pleased to hear you say today, if I read you right, delay is no longer something that we can afford with legislation of this type.

I can say to you, Mr. Chairman, if we were not hamstrung these days by the processes and procedures and if the only tax measure we ever see around here is in reconciliation, you and I would find the first opportunity that a tax bill showed up on the floor to begin a national debate on this issue. I do not think there's any question that if a tax bill showed up on the floor of the United States Senate that was amendable, it would not take us very long to convince our colleagues that Enhanced Oil Recovery is the most cost effective approach to dramatically increase America's domestic supply of oil. Enhanced Oil Recovery would do this with little or no environmental damage by getting more oil out of existing wells. It almost sounds too good to be true.

As a matter of fact, it does so many good things, Mr. Chairman, that you might want to approve it today and perhaps you could gather up a quick quorum and recommend it out through the full Finance Committee.

Senator BOREN. If I can figure out a way to do that, we would give it a try.

Senator DOMENICI. I can assure you that while it may need some work, there will be some testimony here that perhaps a 10 percent investment tax credit would be better than a research and development credit. Clearly several witnesses may endorse this approach including the Administration. We ought to listen tentatively to them.

I think it is fair to say that Americans are worried about the possibility of another giant tanker disaster like the Exxon Valdez. Many people are worried about new exploration off shore of many areas of our coast line. I see Senate bill 828, as a way to dramati-

cally expand America's at-home oil production in a manner that is sound economically and environmentally. It will not, all by itself, fill the growing gap of dependency, but it accomplishes this worthy goal through the use of a very moderate, modest Federal tax incentive, one that will produce a very major benefit to the American economy.

With your permission, I would like to explain briefly the many pluses of this approach. Oil prices are at $18 a barrel, but if we assume for purposes of this discussion a price of $20 a barrel, Senate bill 828 would increase America's economically recoverable reserves by 25 percent. That is incredible. The amount of new drilling and seismic work and exploration required to increase our reserves by 25 percent is something you and I cannot imagine happening in the foreseeable future. The estimated cost, if the numbers and modeling are correct, would be about 35 cents a barrel.

This bill would lead to the production of 6.9 billion barrels of oil at a loss over decades of about $2.4 billion to the Federal Treasury. Based on my knowledge of enhanced oil recovery projects, I expect that this revenue cost of these incentives to be very small in the first few years.

Just how much oil is 6.9 billion barrels? Bringing that much oil to the United States, Mr. Chairman, from the Persian Gulf will require 5,750 voyages on tankers with the capacity of the *Exxon Valdez*—5,750. Put it another way, every time a tanker of that size does not have to sail from America to the Middle East, and we get oil instead from Oklahoma, Texas, New Mexico, Kansas or California, the cost in direct revenue loss under Senate bill 828 would be about $400,000. But that same volume of oil would be worth $24 million spent in the United States. Not spent in the Middle East. And added automatically to our trade deficit.

That sounds to me like a better than average investment, Mr. Chairman. As a matter of fact, I do not know of any other investment we can make with that kind of return of money, jobs and economic vitality here rather than direct exportation of American capital to foreign countries, in particular the Middle East.

This is the real key. Senate bill 828 will ensure at home production that otherwise will surely be imported. My proposal is based on a simple fact which you and I well know, but I think it serves repeating. Regular oil recovery techniques leave 65 to 75 percent of the oil in the ground. Just because many do not understand what we are talking about, I brought two more samples with me today. This is the oil that comes out when you normally drill a well. It is thin and very easy to get out of the ground. Thick oil that looks like this is what stays in the ground because of its "viscosity," because of its thickness it hardly moves. Nonetheless thick oil can be turned into this which in turn is turned into the fuels for America if you can just get it out of there.

When the oil industry drills a well and extracts all of that oil in a normal extractive way, two-thirds of what is left behind looks like this. The oil that is left in the ground is left there because it is uneconomic to recover it. It takes enhanced oil recovery techniques. Yet, we have the technology that will permit this oil to be taken out of the ground if we will just provide the tax incentives necessary to make it economic in todays low price scenario.

This bill would encourage a far wider use of enhanced recovery techniques and many new ones will occur. These gains, as you well know, do not involve the drilling of thousands of new wells. Assuming $20 a barrel, 428 million barrels would be added to Oklahoma's reserves, Louisiana would add 302 million, my State of New Mexico would add 122 billion, Texas would add 1.9 billion barrels. These gains would be achieved simply through greater productivity from each existing well and we would not be drilling new ones.

This increase is achieved with no rise in the price of oil to the consumers. New investment and new jobs—American jobs—raising employment in areas of relatively high employment would automatically follow. Inevitably that will produce a ripple effect as economic activity increases. As an aside, Mr. Chairman, you and I might have gone to the floor last night when the heralded and touted rural development bill was on the floor. Perhaps we should have offered it as an amendment. The economic impact would be significant for rural America.

I submit to you, Mr. Chairman, for less than the cost of that rural development bill, (projected to cost $200-$300 million), this EOR bill would have produced more rural economic development within the first year, than that rural development bill is going to produce for the American people living in rural America, in this Senator's opinion, if you multiplied it five times and gave it 5 years to work, because it has no essential market place propensities. It is trying to buck the market place.

Enhanced Oil Recovery tax incentives is a way to let the market place work in rural America and with all the other benefits that are forthcoming.

Now I just want to go on with a few other notions. Essentially, you have outlined this bill. The first chart shows the reserve additions for an enhanced oil recovery. It is self-explanatory. I might say if you just look at the first column; $20 oil; if this bill were adopted and if the modeling of the Department of Energy is correct you more than double recoverable reserves. You go from 5 to 12.5 and you note as we go up in price, even all the way up to 32 you would produce substantially more oil with this bill in effect than you will without it. Almost enough even at $32 to justify its continuation.

But I have chosen to cap it at $30. The proposal by the Administration, which we welcome, would phase out at $21 a barrel. I think the tax idea that they have, it deserves our attention, but I do not believe the $21 a barrel cap will work.

This is an important opportunity, in my opinion, for a nation that is even more dependent upon foreign energy sources to take some real action that will have more than one ripple effect. Just imagine, Mr. Chairman, if you could pass a law like this that will dramatically reduce the trade imbalance. In fact, I have some numbers in my written testimony that are startling as to the amount by which you will reduce the trade deficit or conversely, the amount by which the trade deficit will be increased if we lose this oil which is waiting to be recovered and to be used by the American people.

I also want to suggest that when it comes to tax relief and tax credit, it is obvious to this Senator that there are many around

who will say do nothing for oil. We must convince them that this combination tax incentive, that is encapsulated in my bill which you are my prime cosponsor, is the kind of tax incentive that will work for all Americans. There are benefits for all. Benefits to our economy, to our trade balance, to those who worry about our continual danger from tanker spills, those who are worried about off shore and the environmental damage there would all be better off and have less to worry about if Congress enacted this bill.

We are not suggesting that our bill will eliminate the need for conservation or oil spill safety. But clearly to the extent that we don't capture this heavy oil. Other oil will have to come from one of two sources—off shore or foreign. There is no other way to look at it.

I submit that between us we must do some convincing. Frequently around the Congress the most obvious is the least recognized. I don't think we have to wait around for a national energy policy. This would fit into anyone's sensible and logical energy policy.

I thank you again for holding the hearing today, for your opening remarks, and let me just say I am totally at your disposal to help you wherever I can. I am not on the Committee. I believe this would fit in the Budget reconciliation bill. I think you can easily make room for it. You are most concerned about the first year's revenue loss and I urge you to try to get it included. I have lobbied some of your members and I will continue to work on these using the best sense of that word.

Obviously, they are not oil patch Senators, but I think from the ones I have talked to they understand that this is an American bill and not an oil patch bill.

Thank you very much.

[The prepared statement of Senator Domenici appears in the appendix.]

Senator BOREN. Thank you very much Senator Domenici. You are absolutely right. I think people are beginning to understand that this kind of proposal is not something that simply will benefit oil producing States. This is, indeed, a proposal that will benefit all of America. When you consider, as you have indicated, that the cost of 35 cents a barrel can ultimately add 25 percent to the total domestic reserves of this country, with all the benefit that will come to the trade balance, with all the benefit that comes to increasing our national security, it is very, very clear that this is in the interest of all Americans wherever they happen to live in this country.

We are making some real progress. I do think there is growing understanding on this Committee and I am determined that we not let this year pass without getting this enacted, that we do make every effort to get it on reconciliation. It does have very reasonable costs as we are forced to figure them under the budgetary procedures. I am really hope we will be able to get it done.

Let me ask you, you talked about the proposal that the tax incentives be capped at $21 per barrel and you suggest $30 a barrel in the proposal. Could you go into why you feel that it would be insufficient in terms of getting this production for us to limit the help once the $21 figure is passed.

Senator DOMENICI. Mr. Chairman, first let me tell you one other fact that I forgot that I think both you and I ought to continually remind people of. There is not a very simple fact that we get from this model and from Treasury. For every dollar in tax incentives we reduce America's trade deficit by 50—50 to 1.

Senator BOREN. Every dollar in tax incentives here——

Senator DOMENICI. Reduces the trade deficit by 50.

Now I know of no economic incentive, or competitiveness policy that comes close to paying such big dividends.

Now why do I say no to the $21 cap. First, let me say there is a tradeoff. In my legislation I stop the tax incentives when the tax payer has captured his costs involved. So whenever "pay back" occurs they do not continue the tax incentives. Some propose that the incentives continue indefinitely. I believe even the Presidents proposal would continue the incentives indefinitely, beyond the recapture.

I have been convinced by the correspondence that I received that $21 a barrel is not enough to bring very much of the oil to the surface and put it into the American market place. I would believe it would so small in comparison to what we are trying to do that it would hardly justify going through the exercise of reinstituting a significant old tax incentive and placing a new one there. So I believe the trade off should be a $30 phaseout with, a recapture limitation.

Senator BOREN. I think that is a very reasonable proposal. And after all, what we are after is not some small reaction if, as you say, we are going to go through with it, if we are going to go through the process of the recordkeeping and the rest of it that will be required we want to do something that is significant that will get the kind of production response and the increase to reserves that will really make an important difference for the country. I would certainly agree with what you have said.

I would welcome you, if you would like, to join me to hear some of the other witnesses that will be with us with morning—or this afternoon. And again, thank you for the contribution you have made with this proposal.

Senator DOMENICI. Thank you very much, Mr. Chairman.

Senator BOREN. All right. Congressman Andrews was to be our next witness. They are having some votes over on the floor of the House right now and I understand that he will be joining us shortly. So we will proceed ahead with the Assistant Secretary for Tax Policy, Mr. Kenneth Gideon, from the Treasury Department.

Mr. Gideon, we appreciate your being with us today to consider this important proposal. As I have indicated, we are pleased that the Administration has come forward with some specific proposals.

I see Congressman Andrews has joined us now. Is your time situation all right so that you might want to hear Mr. Gideon's testimony as well. Let me say that Congressman Andrews has also joined in the series of legislative packages that would provide additional incentives for domestic productions, some very important initiatives. So I know he has real interest in what the administration has been proposing and Treasury's reaction.

Mr. Gideon, we are very happy to have you with us.

STATEMENT OF HON. KENNETH GIDEON, ASSISTANT SECRETARY FOR TAX POLICY, U.S. DEPARTMENT OF THE TREASURY

Mr. GIDEON. Thank you, Mr. Chairman. I am pleased to have this opportunity to present the views of the Treasury Department concerning the tax implications of S.828—the Enhanced Oil and Gas Recovery Tax Act of 1989. The bill would amend the Internal Revenue Code of 1986 to provide incentives for the removal of crude oil and natural gas through enhanced oil recovery techniques.

The bill as introduced has three major components. The first component is an increase in the depletion rate to 27.5 percent for domestic oil and gas recovered through enhanced recovery techniques, which would be phased down as the price of crude oil increases above $30 a barrel, adjusted for inflation.

Second, there would be an exception from the alternative minimum tax rules for excess depletion and excess intangible drilling costs that are incurred with respect to domestic properties that produce oil and gas through the use of enhanced oil and gas recovery techniques if, again, the average removal price of oil for the taxpayer is less than $30 per barrel, again adjusted for inflation.

Finally, there would be a 10 percent research and development tax credit for research to discover or improve tertiary recovery methods. In addition, the bill would generally not treat barrels of enhanced tertiary oil and gas produced by domestic producer or royalty owner as barrels of oil or gas produced by such person in applying the 1,000 barrel a day limitation for the percentage depletion deduction.

Finally, the bill would increase the net income limitation from 50 percent to 100 percent of net income in the case of depletable property which produces domestic incremental tertiary crude oil or natural gas during the enhanced recovery period. The increase would apply to both independent and integrated producers.

As you are aware, the President proposed in his budget for fiscal year 1990 a new incentive program for oil and gas drilling which would produce tax incentives for both the removal of crude oil and gas through enhanced recovery techniques and for the exploration of new oil and gas fields. Under the President's proposal the Code would be amended to allow a temporary 10 percent credit for the first $10 million of expenditures per year per company on exploratory intangible drilling and development costs and a 5 percent credit for the balance.

It would allow a temporary 10 percent tax credit for all capital expenditures on projects that represent new applications of tertiary enhanced recovery techniques to a property. It would eliminate the transfer rule which discourages the transfer of proven properties to independent producers and royalty owners. It would increase the percentage depletion deduction limit for independent producers to 100 percent of the net income of each property. And finally, it would eliminate 80 percent of the current alternative minimum tax preference items that are generated by exploratory intangible drilling and development costs incurred by independent producers.

The temporary tax credits would be phased out if the average daily U.S. well head price of oil is at or above $21 per barrel for a calendar year. These proposals would take effect January 1, 1990.

The President's initiative will be detailed in a bill which is currently under preparation.

The President's proposal and S. 828 share the goal of increasing domestic oil and gas reserves as a means of improving our national energy security. While we prefer the proposals outlined in the budget, we believe that alternative proposals such as S. 828 should be explored. Indeed, S. 828 and the President's proposal have many similar features.

Like the President's proposal, the bill addresses the need to increase the percentage depletion deduction limit, although we would apply the increase to independent producers with respect to all domestic oil and gas projects. In addition, we are encouraged to learn that modifications have been suggested by Senator Domenici and his staff to S. 828, which we understand would limit the amount of the bill's depletion incentive to recovery of the investment in a tertiary project and would replace the R&D credit with a more general credit for capital expenditures on tertiary projects.

As modified, either of these provisions would be more closely aligned with the President's proposed tax credit for tertiary projects. We believe, however, that a tax credit, whether along the lines of the President's proposal or the bill's credit provisions if they are modified—as we understand they may be—would provide a more effective incentive than the 27.5 depletion rate proposal because the credit corresponds directly to the expenditure. We would not favor providing both a credit and increased depletion.

It is also our belief that oil and gas provisions should not be limited to encouraging the reclamation of old fields, but also should encourage exploratory drilling and that the incentives that we do adopt should be as cost effective as possible. We believe that the provisions of the President's initiative are a more efficient means to reach the goals that we all share.

With that, Mr. Chairman, we have provided in our written statement considerably more detail and specific comments on the bill. But I would be pleased to answer the Committee's questions at this time.

[The prepared statement of Mr. Gideon appears in the appendix.]

Senator BOREN. Thank you very much, Mr. Gideon.

Has there been a revenue estimate given in terms of the total cost of the package that the President has advocated?

Mr. GIDEON. Yes, Mr. Chairman. We have a revenue estimate prepared by the Office of Tax Analysis. Just a moment and I will give that to you. It was published with our proposal. We believe that, adding everything together, the exploratory credit is about $1.2 billion over the 4-year period that was projected there. That is not a 5-year number. And the tertiary credit we believe will be somewhere between $100–$200 million over a 5-year period.

Senator BOREN. All right. Then there are some other elements to the President's proposal as well, aren't there?

Mr. GIDEON. That is correct. The 100-percent depletion allowance basically scores in the asterisk range through all the years. In other words, less than $50 million a year. The 80 percent AMT provision basically would cost about $100 million a year.

Senator BOREN. And then you have net income limitation?

Mr. GIDEON. I do not know that I have a revenue estimate on that piece, Mr. Chairman.

Senator BOREN. Will the President be—and by comparison, how do you score the——

Mr. GIDEON. I am sorry. I am informed that it was included in the asterisk numbers.

Senator BOREN. In regard to the transfer rule as well, what do you estimate the cost to be then under S. 828?

Mr. GIDEON. It has been something of a moving target so I am a little reluctant to put out an estimate at this time until we come to rest on a definitive proposal. However, our estimates are in the same range as the Joint Committee's.

Senator BOREN. Will the President advocate the enactment of his package this year in terms of the reconciliation process?

Mr. GIDEON. Senator Boren, we would love to have the package enacted provided that we all pay for it. I think that if you follow our budget we think we can pay for what we recommended. I think that if Congress makes other choices then we are faced with the necessity of paying for it.

Senator BOREN. Has he suggested specifically in terms of the jurisdiction of the Finance Committee, as you know, we will be forced to act in this Committee to find the savings principally within the Tax Code itself, raising other revenues to pay for it. Have there been suggestions for sufficient revenues in order to come up with the offsets?

Mr. GIDEON. The budget contains several such provisions. Some of them have been adopted in the Ways and Means Committee, at least tentatively, some have not. If you took some of those that were not, you would have more than enough to cover this proposal.

Senator BOREN. I appreciate what you have said. I, of course, am very pleased that the President is also suggesting some items that will encourage the exploration as well. My commitment to wanting to do what we can with an enhanced oil recovery, certainly as you know from reading the legislation which I have introduced, shows no lack of enthusiasm for also doing what we can do to bring about new exploration as well. I think we really need to be doing both.

Now you have said that you have advocated phasing out the help based upon a national average price. I wonder if you don't think that will create some problems given the difference between, say, the New York markets, the average producer prices. In Oklahoma, for example, there are quite a few variations here in terms of posted national prices on a regional basis that could affect what projects would be economic in certain areas.

Why do you opt to go with a national price as opposed to an actual price received by the producer?

Mr. GIDEON. There are significant problems in going the other way as well. In other words, producers need certainty in terms of engaging in these projects. If we use a national price and we lag it, they will always know that their project will qualify. If we use an actual price, then they are somewhat at risk, although granted, if it went up, they might not consider that such a bad deal as to whether the incentive would or would not be available. It certainly will be easier to administer if we use a national price standard.

Senator BOREN. As I understand in listening to your testimony you, obviously as one would expect, you express preference for the President's proposal over any other proposals that might be made. I would expect you to do that.

Mr. GIDEON. My job——

Senator BOREN. I would say you might be in some jeopardy if you did come before the Committee and say you preferred our alternatives over the President's. We might all have a little trouble explaining that when you went back to the office.

Listening to your discussion and speaking about the two principal modifications that Senator Domenici has already indicated that he would be willing to make, plus further study of the legislation if we can find ways to improve it, I gather that setting aside the question of other alternatives and being for other matters as well, that your general reaction to this legislation—that you are generally positive as opposed to negative.

Mr. GIDEON. Yes. We all operate under a budget constraint and that one operates here as well. Having said that, we clearly want to provide an incentive of this sort for tertiary projects.

Senator BOREN. Right.

Mr. GIDEON. I think it really then comes down to a question of which will be more efficient, a depletion type incentive or an investment credit type incentive.

Senator BOREN. Right.

Mr. GIDEON. I'd be happy to discuss why we think one is better than the other. We simply think it is better targeted to the cost. Your idea is to get the producer to actually do this. If you make it success dependent as you are doing with a depletion type standard, we just do not think you are getting the same efficiency in terms of inducement that you would get out of a straight credit.

Senator BOREN. What would the cost of those two different approaches be? Is there any significant difference in cost as you look at the cost, as opposed to a tax credit, as opposed to——

Mr. GIDEON. I am reluctant to talk about cost in the Domenici proposal and your proposal right now if you make the modification. Simply because we need to estimate what your cap would do.

Senator BOREN. Right.

Mr. GIDEON. I think to speculate not knowing what the reality is I think would not be productive right now.

Senator BOREN. Senator Domenici, any questions that you would like to ask of Mr. Gideon?

Senator DOMENICI. I want to ask a couple questions if I might. Assuming that the current estimate of reducing the trade deficit $50 for every dollar in tax incentives that we could provide under S. 828, do we have any way of estimating the economic affect of such a change?

What bothers me is we are going to get hung up over whether this bill is $50 million on the revenue loss side in the first year, $150 million in the next year and some numbers that we have in a document. And yet, it seems to me that impact on the trade deficit should be taken into account in revenue estimates and it is not. Yet most great thinkers agree that the trade deficit is not just a nice number to banner around. The trade deficit has a big negative impact on the American economy.

I know you are not here as an expert on trade. But it seems to me that when we talk about something that has the potential of a $50 trade imbalance trade reduction for a dollar tax incentive tnat we ought to be talking about another ledger that has to have some kind of cost estimating benefit that we do not talk when we discuss revenue estimating.

Is it fair to say at least this: That to significantly reduce the trade imbalance—$50 to $1 ratio—would have some positive effects on the American economy and on tax receipts of the future that we are not measuring today on economic vitality?

Mr. GIDEON. I think I could agree with your macro economic proposition and then quickly caution you that given the conventions of revenue estimating, it will not show up. I think that revenue estimates from time to time may frustrate all of us but if we do not pretty much stick to the rules by which we do them they lose their primary value to us. I think that is comparability of proposals.

The difficulty with trying to eject macroeconomics effects beyond the overall assumptions of the CBO over here and the Council of Economic Advisors and the Treasury and the other economic forecasters on the administration's side, is that they make your numbers very subjective. That does not mean that subjective numbers are bad numbers though, Senator.

It seems to me that often the Congress is concerned about those kinds of subjective decisions and will decide that yes, there is a value here beyond what shows up in raw revenue estimates.

Senator DOMENICI. I want to add one more that I think deserves our subjective consideration and then tell you why I think the Domenici proposal, even using your test of efficiency is superior, assuming that we change the R&D tax credit to a tax credit.

Our evidence is, Mr. Chairman, that 1,800 wells were abandoned in the last period of time that we measured. That was three times as many as the previous year; and that is growing. To the extent that I understand that situation, once abandoned, forever lost.

Senator BOREN. That is right.

Senator DOMENICI. Now I am 100 percent on the side of a broader based bill to encourage more exploration—Senator Boren and I cosponsored several such bills. It seems to me that we ought to get some credit for being realistic and practical when we introduce a targeted bill like this.

Let me just use last year. If we did not abandon 1800 wells, we would have 1800 more wells than we had. To get 1800 *new* wells we have to go out and drill 1800 new wells and probably drill at least 3,600 dry holes in the process. If we continue current policies we will only recover but 30 percent of the oil when we drill those new wells. I believe there is a very big plus in getting more oil from such wells for maximizing recovery of oil we know is there. This is especially true when we have technology to extract the oil. That is the responsible thing to do in a country with some of the most difficult to explore for and difficult to produce prospects for new production. We don't have a lot of choices.

Would you agree at least in principal that that too is an important subjective determination?

Mr. GIDEON. Well, I think the fact that we have proposed tertiary incentives is at least a partial answer to that. I really would try to avoid getting into a debate as to whether exploratory drilling is better than tertiary. I think that our strong view is that you need both and that we would like to see in the incentives balanced. Then you get to those hard choices about how much can you pay for each kind.

Senator DOMENICI. I wholeheartedly agree. Let me just give you a couple of numbers. They are just my best attempt at extrapolating the evidence that we were presented with. Your proposal phased out at $21 a barrel and the 10-percent credit applied only to tertiary recovery. Our estimate is that the Administration proposal would yield, at $21 per barrel, about 3 billion barrels of oil. At $20, which is where our analysis started instead of $21, S. 828 would yield 7 billion. That means S. 828 would result in more than two times as much oil being produced as the Administration proposal.

I think we should recommend an efficiency test, and see just how efficient S. 828 proposal is. If it produces more than twice as much oil as the Administration proposal then I think we ought to get the cost estimate to the tax coffers and see just how much more efficient it is to go with a combined incentive package that would produce more enhanced oil.

I am not asking for your comments because you have been very helpful. I appreciate the Administration appearing today. I appreciate your optimism in having at least a strong position on your side on behalf of the Administration that we are moving in the right direction. I personally thank you for that.

I have no further questions, Mr. Chairman.

Senator BOREN. Thank you very much.

I want to thank you very much, Mr. Gideon, for being with us. We look forward to continuing to work with you because we are very serious about trying to get something accomplished toward meeting the objectives we obviously share when this reconciliation proposal comes before the full Finance Committee. We thank you for being with us today.

Mr. GIDEON. Thank you, Mr. Chairman.

Senator BOREN. I want to call on our colleague now, Congressman Mike Andrews, from the State of Texas. As I said a moment ago, we have introduced legislation together, companion bills on both sides of the Capitol to encourage not only enhanced oil recovery but also additional drilling and exploration to try to end the trade imbalance that is growing daily and the threat to our national security. Congressman Andrews is well recognized in the energy field and one of the most effective members of the Congress on tax policy issues on his side of the Capitol.

Congressman Andrews, we are very pleased to have you with us today and welcome your testimony.

STATEMENT OF HON. MICHAEL A. ANDREWS, A U.S. REPRESENTATIVE FROM TEXAS

Congressman ANDREWS. Thank you very much, Mr. Chairman and Senator Domenici. I commend you for holding these hearings and I appreciate very much your inviting me to come testify today.

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The leadership that you have shown in the development of oil and gas legislation throughout the years has been an important contribution and I am very proud to be the author of your companion bill on the House side. It is House bill H.R. 658.

I am also here today as an original cosponsor of legislation soon to be introduced in the House by Representative Jake Pickle of Austin as a companion to Senator Domenici's bill. The Enhanced Oil and Gas Recovery Tax Act of 1989 provides necessary tax incentives for the removal of crude oil and gas through enhanced recovery techniques and a tax credit for research and development to discovery or improve tertiary recovery methods.

Promoting the recovery of oil and gas already in place will certainly help reduce our dependency on imported oil. This bill will stimulate marginal production, including the development of stripper wells and heavy oil.

While I strongly support the Enhanced Oil and Gas Recovery Tax Act of 1989 I believe that we must do more to put our domestic oil and gas industry back on its feet again. U.S. oil production is today below 8 million barrels a day—the lowest level in a quarter century. More than half the drilling rigs operating 3 years ago are in moth balls, rusting or dismantled. In 2 or 3 years 50 percent of the oil we consume will flow from foreign rigs, a dependence we have never experienced in the history of our Nation.

Unknown to most, oil and gas is one of the most heavily taxed industries in the United States. The average effective Federal tax rate for U.S. oil companies has been well above that of firms in other industries throughout the 1980's. Other nations are lowering their taxes on energy production and attracting capital away from the United States to develop their resources. If our tax system does not stay competitive, U.S. resources will stay in the ground. Our economy will be the loser and our national security will surely suffer.

This bill is an important step. I think the bill, Senator, that you and I have filed is targeted to provide especially real help for the struggling independent producers who drill about 80 to 90 percent of all the wells in the United States. Both bills provide a new exploration and development tax credit, a new production credit for marginal well production, removes intangible drilling costs from the minimum tax, extends the nonconventional fuels credit and reinstates tight sands gas qualification for this credit. It also increases percentage depletion, repeals the property transfer rule, and repeals the net income limitation on percentage depletion.

I am cognizant of the challenges that we face in Congress meeting the deficit reduction targets, especially this week as we debate on my side of the capitol reconciliation bill. But we really cannot delay, not only the debate, but dealing with this issue front on. I want to find a revenue source to pay for these proposals. We have to enact fiscally responsible legislation which will assist the domestic oil and gas industry. Our economy and our national security depend on it.

That is the end of my prepared testimony, Mr. Chairman. Again, I thank you very much for letting me come by and visit with you.

[The prepared statement of Congressman Andrews appears in the appendix.]

Senator BOREN. Thank you very much for taking the time to cover over and be with us. I know there is a full schedule of activities over on your side of the Capitol today.

Would you agree in terms of the research that you have done on this particular proposal with Senator Domenici who indicated that he felt we could get as much as an addition of 25 percent in the proven reserves of the country for costs as low as 35 cents a barrel here, and that given the cost effectiveness of this proposal, it is one that we should attempt to try to get enacted into law this year even with the small budget package that we are working with this year, which of course makes it all the more difficult, that this is one of those steps, small in its initial revenue impacts that we should seriously consider taking this year and not putting off until next year when we might have an easier time because of the larger budgetary package?

Congressman ANDREWS. I certainly agree. I think we should try to do that. We do face a dilemma though in that these issues tend, especially in this tax year, to be revenue driven as much as they are driven by tax policy and energy policy. Our bills—your bill and my bill—probably will cost about $17 billion over 5 years. I think it is a good bargain for the country and the taxpayer. But finding the $17 billion is a difficult task.

We are today debating the capital gains provisions, for instance, on our side of the capital. Where we go with the revenues we have will be very, very difficult choices without a large revenue stream to pay for those programs. If we cannot make accomplishments on the energy front this year, we surely must prepare ourselves to strike next year. I think the revenue demands will be enormous next year in the budgetary problem for both our Committees and that will afford us some opportunities, I think, to push our bills forward.

Senator BOREN. Well I think you are right. I think obviously given what we are having to work with, the constraints we face this year, coming up with a package which makes ultimately great sense for the country with a price tag and an estimate that we have for our bill as high as it is, it is going to be very difficult to get much of it enacted this year.

I am hoping we can at least make some small starts and next year we will finally step up to the plate and take on the really tough problem of dealing with sound economic and budgetary policy for the country and that means reordering a lot of things, including something that will help get our cost of capital down and get savings up in this country and be a policy for economic competitiveness as well as a sound energy policy.

I am hoping that one of these days we will begin to undertake this kind of major revision of our tax and economic policy that the country longs to have. Until that happens, and if that does happen, we obviously will be dealing with a very large package in terms of total dollars and reallocation of tax incentives. That is the time for us to get our proposal adopted.

But I still hope we will be able to make this first step this year. One of the first steps that it would seem to me to be very reasonable to make, given the revenue estimates, would be this enhanced oil recovery project.

Congressman ANDREWS. Good. I would agree with you.

Senator BOREN. Thank you very much for taking the time to come over. Again, we appreciate your leadership's great encouragement to us on the Senate side, to have someone that is working with the vigor that you are demonstrating on the House side for a common purpose. We appreciate it very much.

Congressman ANDREWS. Thank you very much, sir.

Senator BOREN. Thank you.

I am going to ask now if perhaps our next witnesses might come up as one panel. There will be five coming up to the table at once if you can. The Hon. John Sharp, commissioner of the Texas Railroad Commission, from our good neighboring State of Texas; Dr. Charles Mankin, professor of geology at the University of Oklahoma and director of the Oklahoma Geological Survey, from Norman, OK. It is always good to place people from Austin and Norman close to each other so they can watch each other. Dr. William Fisher, director of the Bureau of Economic Geology and chairman of the Department of Geological Sciences at the University of Texas.

Dr. Mankin, I realize I really have put you in a difficult position to be flanked on both sides here by Texans, but I know they will profit from the wisdom and ideas that you can share with them while they are there with you.

Mr. Joseph King, district manager of Hobbs District of Texaco Inc., from Hobbs, NM; and Mr. David Martin, director of the New Mexico Petroleum Recovery Research Center, Division of New Mexico Institute of Mining and Technology.

We are very happy to have all of you and what I would propose that we do—I realize that we could certainly profit from extended testimony by all of you and it would be testimony that would be of great interest to me and my colleagues who will read the transcript of the hearing today, but I think in the interest of time, if we could, what I would like to do is have each one of you make a presentation of 5 minutes and we will take your full statements and insert them into the record.

We will just go right down the panel. I will do my best to restrain myself. I always give this instruction to members of the committee when I am chairing a hearing and I am always the one that violates the rule. But I will do my best then to withhold my own personal questions until we have given each one of you an opportunity to speak and then I can address questions to all of you at the same time or follow up with some individually.

So, Mr. Sharp, why don't we begin with you. We welcome you. We appreciate the role that you are playing in your State and the expertise which you bring to the Commission and we are very, very happy to have you with us today.

STATEMENT OF HON. JOHN S. SHARP, COMMISSIONER, TEXAS RAILROAD COMMISSION, AUSTIN, TX

Mr. SHARP. Thank you, Mr. Chairman. On behalf of many thousands of Texans, we appreciate the work that you and Senator Domenici and others are doing on this futuristic project. I say that because I think the energy sectors of our two economies, particularly in the energy industry, have two great futures. One is natural gas.

A lot of that is going to be determined by what you do on the Clean Air Act. But the second one is certainly enhanced recovery of oil.

I have been asked here to testify about a bill that I wrote and we passed in the last session of the Texas legislature on this subject. It was the first tax relief measure Texas has passed. I might add that we worked on it for about 2 years and we were much in the same position I suspect as you are. We had a comptroller that said you better make sure it does not cost anything and you better make sure it works. We were aiming at trying to jump start ahead of time a bunch of projects that we knew were there but we wanted to get those projects on the ground.

What we did, using the severance tax, is we simply said that you have a 4-year period of time from the time this bill passes to register with the Railroad Commission that you are going to enhance or start the project. That immediately put reservoir engineers and a bunch of people to work. If you wait until after this 4-year period of time, you miss it all. As a result of that it forces the industry to look at that because you just do not know what the future will hold and you have to look at every project.

During that 4 years—anytime during the 4-year period of time—you can prove to the Railroad Commission that you have created a positive response in that reservoir. Once you prove it, you have 3 years to do it if it is a secondary water flood project; you have 5 years to prove it if it is a tertiary project. Once you prove it to the Railroad Commission and the Railroad Commission says, okay, it is a good one; you have arrested the decline or you have created a positive response, then for a 10-year period of time you have a 50-percent severance tax reduction on those wells.

We have been getting—the bill does not go into effect until September 1 and we have literally a tremendous response at the Railroad Commission from people already anticipating projects that they knew that they had.

What we did at the comptroller's request, we created a 5 to 1 positive fiscal note for the State of Texas. I know that the comptroller of public accounts and I am sure Treasury is the same way, do not like to consider future revenues. But we excluded natural gas—casing head gas—from this project, which in Texas is taxed at 7.5 percent. We did not have a lot of objection from the industry on that and that probably because we could not have passed the bill without it. But that created, along with some other things, a $50 million positive response in the Treasury, an expenditure of under $5 million. That Exemption goes for a 10-year period of time.

The interesting thing about it is that we also had some help from some unusual allies. I think you will find, as we did, that the folks that are against ANWR and the folks that are against off shore drilling ought to be the very first ones here supporting your bill because it is about as——

Senator BOREN. It is ironic, we are debating the oil spill legislation on the floor of the Senate as we meet at this moment.

Mr. SHARP. That is right. Because it is like a farmer in Oklahoma—well, actually, the Chairman of the Railroad—Oklahoma Corporation Commission told me, it does not make good sense to buy your oil—he said it is like going across town to get your eggs when

you have a thousand chickens in your backyard and I think there is a lot to be said for that.

The only thing that I would urge you to consider in this is that, in Texas' instance, we have 4,200 water flood projects. We have 30 tertiary projects. And if there is a way to include those secondary projects, that is the independent operators, it would be a big help, I think. Fifty-four percent of our production—total oil production right now—is enhanced recovery counting secondary. I would encourage you to look at shortening the time line that people can get in the project as opposed to someone saying, well, I can always wait 10 years. What we needed in Texas is investment and investment now. That 4-year period of time, use it or lose it, has really got some people putting some reservoir engineers to work on that project.

Our fiscal notes—I think if it is considered realistically the way we did it—there is no way—and believe me the folks on the revenue side tried—there is no way that you can design a bill that produces more benefit for this country, and certainly for Texas, with less expense than enhanced oil recovery legislation. It is a win-win situation if there ever was one. We have looked for 2 years to try to find something better and we could not find it.

Senator BOREN. Thank you very much, Commissioner. You certainly make good sense on the comments that you have made. We appreciate your being here and I will have some follow-up questions a little bit later.

Dr. Mankin, we are very pleased to have you. You have been advising me on energy policy for as long as I can remember. It has always been sound advise. I especially appreciate you being here today and share your thoughts with all the members of the Finance Committee.

[The prepared statement of Mr. Sharp appears in the appendix.]

STATEMENT OF CHARLES J. MANKIN, Ph.D., PROFESSOR OF GEOLOGY, UNIVERSITY OF OKLAHOMA AND DIRECTOR, OKLAHOMA GEOLOGICAL SURVEY, NORMAN, OK

Dr. MANKIN. Thank you, Mr. Chairman. It is a pleasure to appear today to discuss the Enhanced Oil and Gas Recovery Tax Act of 1989. I want to thank you and I also want to thank Senator Domenici and his staff for arranging for me to receive the Department of Energy's analysis of the costs and benefits of the various tax incentive options.

As you have so correctly stated earlier, and also Senator Domenici commented about, after conventional production America will leave behind more than 300 billion barrels of oil in known reservoirs for the lack of sufficient geoscientific understanding, advanced recovery technology and price stability to produce it. That is about two-thirds of all the oil that has been discovered in the United States.

The bill before the subcommittee seeks to stimulate production of a large part of this remaining resource base by enhanced recovery methods. As shown in Figure 1 of my prepared statement, about 163 billion barrels of the remaining resource represents the target

for EOR. That is incremental to the current proved EOR reserves which total about 4 billion barrels.

There is a fundamental difference between the provisions of this bill and the set of incentives analyzed by the Department of Energy. That difference dramatically alters the likely effects of the bill. Both the bill and the DOE analysis consider the benefits of restoring the percentage depletion allowance to 27.5 percent and allowing a 10-percent tax credit. DOE considered an investment tax credit but the bill calls for a research and development credit.

An investment tax credit, when combined with the increased depletion allowance, would have a tremendous and synergistic stimulatory effect in encouraging new EOR projects. But the R&D tax credit would likely have very little stimulatory effect. The R&D credit may encourage some pilot projects, but that appears to be the extent of its potential.

Consequently, as shown in Table I on page 7 of my prepared statement, the benefits the legislation being considered today are really substantially less than anticipated by the sponsors. The actual effects would be much closer to those of simply restoring the depletion allowance to 27.5 percent without the added synergistic benefit of the tax credit.

If passed as it stands, I would expect this legislation to stimulate only about 18 percent—less than one-fifth—of the incremental reserves anticipated. Trade deficit reduction would only reach about $24 billion, about $115 billion less than estimated. And net public sector benefits, though still positive, would reach only about $600 million. That is a lot less than the $5.4 billion anticipated by the sponsors. But while the incremental reserves stimulated drop to less than one-fifth, the cost to the government would be cut by only about one-third to about $1 billion.

Clearly, Mr. Chairman, if this bill is to achieve its intended goals at the optimal level, the bill must include the 10 percent investment tax credit. The R&D tax credit alone simply does not fill the bill. The proposed R&D tax credit provisions are, in my view, ineffective and should be deleted. The bill should be amended to provide a 10 percent investment tax credit instead.

A relatively less restrictive 10 percent, or 15 percent, R&D tax credit for all future EOR related research and development expenditures could be substituted for the deleted R&D tax credit provision. That would be much more effective than the one proposed. Alternatively, Mr. Chairman, I would recommend that the Congress look carefully at the idea of direct funding of R&D at a proper level for a focused program of research to accomplish the needs for improving our geoscientific and engineering understanding to greatly enhance our capabilities in both EOR and unswept mobile oil recovery.

The Interstate Oil Compact Commission, using the same TORIS analytical system that was used by DOE to analyze this bill, has prepared several studies of the potential of tax incentives—in combination with technology advancements—to improve the ultimate recovery potential of the nation's remaining oil resource. Both the IOCC's New Mexico and Oklahoma reports have shown a tremendous synergy between a combination of State and Federal incentives and the benefits of advanced technologies. In some cases the

effect of the synergies is to more than double or perhaps triple the reserves stimulated by either incentive by itself.

I have provided a summary of these findings for Oklahoma in Figure II of my prepared statement. Based on this report, in 1986 the Oklahoma legislature passed a law granting severance tax relief to the point of payback. As you have just heard, the State of Texas has recently passed similar legislation and I understand the State of New Mexico is following suit.

Today, this Subcommittee has the opportunity to recommend that the Federal Government shoulder its share of the burden and provide the basis for the States and the Nation to take advantage of the potential synergies of these combined State-Federal incentives.

Mr. Chairman, if this bill is amended to include the 10-percent investment tax credit and consequently achieve its intended goals of stimulating substantial new EOR reserves, reducing the trade deficit and increasing net public sector revenues, it will fulfill an important part of the Nation's energy goals.

Finally, Mr. Chairman, I would like to say that if modified to include the investment tax credit, this bill can be highly effective in stimulating enhanced oil and gas recovery projects. I wish to remind you, however, that the EOR target is only a part of the entire remaining resource base. Today we are talking about creating incentives for about 6.9 billion barrels. Educated assessments of the total recovery potential from the entire remaining oil resource base suggest that as much as 60–100 billion barrels of reserves could ultimately be added with the appropriate combination of tax policies and coordinated R&D.

Thank you very much.

[The prepared statement of Dr. Mankin appears in the appendix.]

Senator BOREN. Thank you very much, Dr. Mankin.

Dr. Fisher.

STATEMENT OF WILLIAM L. FISHER, Ph.D., DIRECTOR, BUREAU OF ECONOMIC GEOLOGY, AND CHAIRMAN, DEPARTMENT OF GEOLOGICAL SCIENCES, UNIVERSITY OF TEXAS AT AUSTIN, AUSTIN, TX

Dr. FISHER. Thank you, Mr. Chairman; it is a pleasure to be here today. As you pointed out earlier, we are setting into place some real unfortunate trends in this country over the last 3 years. We lost about a half a billion barrels worth of production capacity. We have consumption up 2 million barrels a day and we are seeing now total imports exceeding domestic crude production.

These are trends and events that need not be. We have in the United States yet a substantial resource base. I think the kinds of incentives that are being envisioned in the Senate bill 828 are on target and moving in the direction that is essential that we go. It does provide real incentives and it addresses a very large resource target which should result in significant incremental additions.

I support the thrust and the direction of that bill. There are at least a couple of areas that I would recommend that we consider broadening and that would enlarge substantially the incremental

reserve additions on beyond what is envisioned even in this particular bill.

First, as Dr. Mankin has just pointed out, and a number of others, an investment tax credit, say at 10 percent, if it were provided it would be a tremendous stimulus in terms of leading to increased operator investment and increased production.

The second area, as Commissioner Sharp has referred to, would be significant if the bill were extended to cover at least some categories of secondary recovery. I do not particularly envision any standard normal traditional secondary process. But there are a number of situations, particularly stripper leases, reservoirs that are very complex geologically that still have a large volume of unrecovered movable oil within them, even though they are at dense spacing, trying to capture that oil in the traditional way of in filling, might be prohibitively expensive.

There are other categories, for example, where a reservoir is now completely under flood or at least a standard flood that may qualify. If this were to be the case—in other words, if the bill could extend to at least some categories of secondary recovery—this could be a tremendous benefit to many of the independent operators, and it addresses an even larger target—not in terms of total resource, but in terms of what you can get at over the shorter term.

I think the kind of production response that has been shown in the DOE analysis is certainly consistent with anything I would have looked at. I think, however, if you could extend to the measure, if it were appropriately structured, to secondary recovery, you would probably get more oil in absolute terms. Maybe not in percentage increment increase, but in absolute terms, you would probably get a greater volume of oil per investment in incentives and probably be able to accomplish it in the, say, $20–$25 range. In other words, you can phase out at about $25 and still capture advanced secondary oil.

I am not prepared to lay out all the specific areas of definition. But this is one I would call to your attention. If we could broaden in that direction and get some reasonable definitions in what we might call advanced secondary recovery, then that would address the whole range of unrecovered oil, both mobile oil or movable oil and residual oil or immobile oil of the kind that the bill addresses under EOR.

So I would recommend consideration of those two points. Clearly, there would be a higher cost in broadening the bill in terms of revenue costs. But the cost in revenue, is rather directly related to the kind of response that you are going to get back in terms of long-term production. So to the extent that that can be done, if we can broaden the bill in the area of an investment tax credit and to the inclusion of movable oil recovery through advanced secondary techniques, this would enlarge substantially incremental additions that we could expect over the longer term.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Fisher appears in the appendix.]

Senator BOREN. Thank you very much, Dr. Fisher. We appreciate your comments very much and I want to return especially to the comments on secondary recovery in just a moment.

Mr. King.

STATEMENT OF JOSEPH E. KING, DISTRICT MANAGER, HOBBS DISTRICT, TEXACO, INC., HOBBS, NM

Mr. KING. Yes, Senator. I would like to express my appreciation for being able to address the committee on such an important issue. It is kind of nice to be a working oil field hand having a chance to say something here.

I am the district manager for Texaco's Hobbs District. This district includes West Texas north of Andrews to the panhandle and all of New Mexico, except the six counties in the northwest part of the State. So my district is in the heart of the Permian Basin, particularly the oil-producing horizon in the San Andres foundation containing mature water floods and high potential carbon dioxide tertiary type projects.

Within my district, we have expended in the last 5 years over 40 engineering man years studying reservoirs, preparing evaluations for tertiary projects within this basin—within the Permian Basin—candidate reservoirs for tertiary CO2 projects.

We have seen a very significant project brought to the point that it could be proposed to Texaco's management and had to be shelved when the WTI oil price declined below $20 per bbl. The economics were not there. I personally believe, as much of the data that has been quoted here points out, in a price range for West Texas intermediate crude—sweet crude, somewhere between the $16-$22 per bbl range, very few projects in the CO2 EOR category would get off the ground. The projects have very difficult economics in this range.

I would like to point out something that applies to the comments of the Treasury and bears heavily on this issue. A typical mature water flood potential EOR project, particularly in the CO2 or chemical flood type category will incur a large up-front initial investment, which as you would know would send a project into a loss category. Then an operator will have to buy significant volumes of injectant which continues to press a project downward. If you thought of it in terms of cumulative cash flow you are still in a negative cash flow position. This could last for 4 to 6 years during which time you are buying large volumes injectants.

If you were faced with an incentive that is tied to price—particularly one that might be tied to a low oil price, you could be in a position of committing your capital, begin buying your expensive injectant and should prices rise slightly, above the limit being caught in your third year of accelerated negative earnings with an expensive injectant that must be bought before you begin to see the response from the project to bring your cash flow positive. You would be facing devastation.

For EOR incentive to be forceful and to bring forth the type of results that Senator Domenici is proposing, we need a stable resource base. We need a stable incentive. That is one of the reasons I heavily favor legislation that has at the heart of it the 27.5 percent depletion credit—the part that brings favorable economics to you once the project begins to arrive, so to speak. All of the incentives that have been discussed have very good points and will defi-

nitely add to our EOR success ratio and the ultimate reserves recovered from it.

But whatever happens, it needs to be stable so that the people that are going to be committing the capital believe that the incentive will be there should the OPEC nations choose to do something to the oil price. I think that is something that needs to be considered and remembered.

Secondly, I tend to have a problem with the estimated cost of the EOR bill. Some of the economic comparisons that I have seen would give numbers indicating the depletion allowance credit and the future Federal income tax paid for the project would be essentially the same. This does not include the revenue that the Federal Government would receive because they have most of the CO2 reserves. So the royalty on the produced CO2 that is going to the increased EOR projects would be an additive in terms of revenue to the Government.

I have seen economics on other significant projects where a depletion allowance credit might be one-third of the future Federal income tax to be paid on the project. The very successful projects will reach payout and be in a positive income tax position to the Treasury, negative to operators, but positive to the Treasury very early in the life of the project. So I am having a little trouble understanding the cost of the bills being presented as negative. I mean, to me it looks like the country is much better off. But I am not a Treasury expert.

Senator BOREN. Wait until you get some of your common sense approach adopted by those who come up with the estimates.

Mr. KING. That was going to be my comment.

Senator BOREN. That might upset the whole system in Washington if we injected that kind of realism in the process.

Mr. KING. I realize that I am speaking from common sense and maybe I have stepped——

Senator BOREN. That is almost out of order. [Laughter.]

Mr. KING. I have one other item I would like to inject. There is a great, great sense of urgency to this bill. I promise you that if operators had to redrill all of the old reservoirs to start a tertiary project, no likely oil price would allow it to happen. If we lose our existing well bores for these future EOR projects we are going to lose the reserves forever. I think that is an unmistakable fact.

In a typical CO2 project—30 to 40 percent of the up front investment would be required for redrilling abandoned wells or for major work overs necessary to the project. Right now I believe that our major mature water floods are somewhere in the neighborhood of about 10 percent of the well, shut in. A study that the DOE did for the State of New Mexico indicated that if the shut in wells that had to be redrilled reached 20 percent, at $24 per barrel—West Texas Intermediate price—50 percent of the New Mexico reserves would be lost—for a 20-percent redrill.

Most of the water floods in my district are mature, with more than 25-year-old well bores. They are suffering corrosion losses internally and externally and more and more wells are being plugged each year. Senator Domenici alluded to this fact. He is exactly right. My experience says that is absolutely true.

So this problem is not going to go away. If legislation does not take place and we lose 25 percent of our well bores, it becomes academic because these reserves will never reach the tank, in my opinion.

I think I have overstated my time as is. I appreciate it very much.

[The prepared statement of Mr. King appears in the appendix.]

Senator BOREN. Your comments have been well worth hearing and I appreciate them very much. There is a lot of wisdom in what you say. You know, it is just a tragedy in terms as you say of the cost that it would take, it would be impossible for us to come up with the resources to ever do it. We have also already paid the environmental costs. It just does not make any sense to allow this resource to be abandoned and lost.

Mr. Martin.

STATEMENT OF F. DAVID MARTIN, DIRECTOR, NEW MEXICO PETROLEUM RECOVERY RESEARCH CENTER, DIVISION OF NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, SOCORRO, NM

Mr. MARTIN. Thank you, Mr. Chairman, Senator Domenici. I appreciate the opportunity to be here to express my views. Revenues from oil and gas are very important to New Mexico as they are for a number of other oil-producing States. There are some figures that are not in my testimony because they were not available until just this week and they are still not official yet. But last year the direct tax income to the State of New Mexico was down 17 percent from 1987. Royalty income was down 18 percent. Of course, that includes about 45 percent Federal royalty.

Production is declining. At depressed oil prices, the revenue to our State has been declining, and prospects for what OPEC is going to do with oil price probably will keep prices low. So efforts such as being proposed here today, I think, are vital to New Mexico and to a number of other States like ours.

I want to commend the sponsors of this legislation for drafting a bill that I think will make a significant impact. The Senator alluded to this. The oil-producing states are in a bad position right now—the domestic oil and gas industry is at stake. We have a real serious problem here and we cannot patch it with a bandaid. It is going to take something that is going to make a significant impact; and in my assessment, I believe this legislation, perhaps with a minor modification, can certainly do that.

There are several documents—and I have supplied some excerpts from information there. The National Petroleum Council did a study looking at enhanced oil recovery. The State of New Mexico in 1986, we had a study, "The Potential for Enhanced Oil and Gas Recovery in New Mexico." There have been similar studies in Oklahoma and Texas now. The information that is included in my testimony gives a feel for the production that you get from EOR as a function of oil price.

Also in the testimony are some numbers that Joe King just referred to—that is, the effect of abandonments. Based on the information that is available to us in this data base that is available in

the Department of Energy, as Joe pointed out, if we abandon as few as 20 percent of the existing well bores we will lose half of our producible recovery by CO2 flooding.

As far as the legislation itself is concerned, I agree with Joe King also about the impact of the 27.5 percent depletion allowance. I think the concept of applying that incentive to payback is sound. That agrees with the assessment that was made previously in the State of New Mexico survey where we were looking at State incentives.

The only suggestion that I would make is to expand the R&D tax credit to include investment, which would also include injectant cost. If I am not mistaken, I think that was what was included in the original DOE survey. With those minor modifications, I would urge the subcommittee to adopt this bill. I think it can have a significant impact and probably even more than what might be obvious here. Because as the original NPC study mentioned, there can be substantial increases in recovery due to what we call advanced technology. That is some of the additional R&D that Charlie Mankin mentioned that will happen if the incentive is there. If the incentive is not there, it will not be done.

So I think this pending legislation can make a significant impact on efforts in research and development, and the implementation of these processes can go a long way in providing us with a low cost resource for well into the future.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Martin appears in the appendix.]

Senator BOREN. Thank you very much.

I apologize but we have just now had the signal that there is a vote occurring on the floor. So we will try to conclude before. We have about another 5 minutes here before we have to rush over to the floor to vote. We will try to include the entire hearing at that time.

Let me say that several of our colleagues have indicated to me that they wish that they could have been present today. In fact, two or three were going to attempt to get here that have not been able to get here so far. But I do not want you to take that for lack of interest because there is very strong interest in the Committee. It is just the fact that every other committee in the world is meeting. Conference committees are meeting. Besides floor activity, I have been shuttling in and out of meetings working on the drought relief bill, among other things today, so there are all sorts of things that are going on at the same time.

But your testimony will be read. Let me say it is also a very important contribution to improving our chances of getting some action on the reconciliation bill. Senator Domenici and I discussed this. And to be in a position to try to move on that bill or any other vehicle that comes along before the end of the year we certainly had the requirement of having a hearing and getting this testimony into the record. So your appearance today has been a great help to us and our efforts to move this proposal forward to the next step and the legislative process.

Let me just ask two quick questions. One, would all of you agree—one or two of you suggested that we broaden the invest-

ment tax credit beyond just the research and development. Would all of you agree with that.

[An affirmative nodding of heads.]

Senator BOREN. All of you would agree.

And you think this would significantly increase the likelihood of the production response and the reduction of imports.

The record will show that all the panelists agreed.

Let me ask also, do all of you advocate—Mr. Sharp talked about the importance of including secondary recovery and I gather that would be for two reasons. One, the again potential production response, the volume that could be generated by the large number of projects; also I would assume that part of your reason would be that it would be you would have greater opportunity to include more independent producers in addition to major companies. Would that be another substantial reason?

Mr. SHARP. Yes, sir.

Senator BOREN. Dr. Mankin, you, Dr. Fisher, the rest of you, let me just ask you individually, would you also favor including secondary recovery projects or at least certain types of secondary recovery projects in the legislation?

Dr. MANKIN. Mr. Chairman, I certainly would. I guess the only reservation I would have is that if it required a substantial period of time to modify the legislation to properly treat that issue. I think the urgency of getting such legislation passed is so important this year that I would hate to see anything that would defer that.

Now I am a strong supporter in expanding to cover more categories and certainly certain categories of secondary recovery ought to be included, but only if it does not defer or delay implementation of the bill.

Senator BOREN. Dr. Fisher, would you comment.

Dr. FISHER. The thrust of my testimony was precisely to include some of that.

Senator BOREN. Certain types you specified in your prepared testimony?

Dr. FISHER. Yes. I would not qualify it as Dr. Mankin has just done.

Senator BOREN. Right.

Mr. King?

Mr. KING. Unquestionably, any form of secondary recovery in my mind—whether it even be infill drilling or it may be particularly—provided it be basically limited to pay back. If you use that as the quality control on it, any secondary effort has got to be beneficial from all ends of it and should be encouraged.

Mr. MARTIN. Yes, Mr. Chairman. We do not care whether you call it enhanced oil recovery or tertiary oil recovery, we want to get more oil out of the ground, oil that we cannot get out now. I do not care what you call it. I think the intent of the bill that was presented here was not to give people a break on something that they are going to produce anyway, but was to stimulate activity on something that we are not going to produce, we are going to leave it in the ground, and we are going to have to buy it from the people over at OPEC.

Senator BOREN. All right. Let me ask Senator Domenici—we are getting down to the wire—but are there any questions that you would like to address to the panel?

Senator DOMENICI. I have no questions. I want to thank all of you for giving up your time here. I might just suggest collaborative efforts on your part and your staff's, perhaps the Committee's and mine. I think what we have heard permits us to perhaps produce a ledger of the pluses that would result under a common sense definition. This common sense definition would count benefits that would be traditional revenue estimating models: For example—trade deficit, $50 reduction in trade deficit to $1 of tax incentives. We should include CO2 royalties on our balance sheet; minimal returns because much of this oil is on Federal land.

Senator BOREN. Direct additional revenues to the government.

Senator DOMENICI. And those kinds of things. We should try to generate a model to show the royalties that will not happen without the bill and the impact on the overall economy. These are factors not taken into account in your CBO and Joint Tax Committee models.

Senator BOREN. Right.

Senator DOMENICI. But I think it is tremendously important.

Senator BOREN. I think that is a very important point.

Mr. MARTIN. Mr. Chairman?

Senator BOREN. Yes, sir.

Mr. MARTIN. Could I make one final point?

Senator BOREN. Yes, sir.

Mr. MARTIN. I would like to say that I do not believe that the phase out at $21, as proposed by the administration is going to make anywhere near the impact that the legislation has proposed.

Senator BOREN. Do the rest of you all agree with that as well?

Mr. SHARP. Yes.

Dr. MANKIN. Yes.

Dr. FISHER. Yes.

Mr. KING. Yes.

Senator BOREN. Well, again, I want to thank you. I apologize. We are going to miss this vote if we do not run right over. So we will not be able to come out and express our appreciation to you individually. But, nonetheless, it is heartfelt and you have made a real contribution to the progress of this legislation and I think to the national interests in being here today. We appreciate it very much.

The subcommittee will stand in recess.

[Whereupon, the hearing recessed at 3:52 p.m.]

APPENDIX

Alphabetical Listing and Material Submitted

Prepared Statement of Rep. Michael A. Andrews

Mr. Chairman, I commend you for holding these very important hearings on incentives for enhanced oil and gas recovery. I commend your leadership in the development of oil and gas legislation throughout the years and I am proud to have you as the author of companion bill to legislation I introduced in the House, H.R. 658.

I am here today as an original cosponsor of legislation soon to be introduced in the House by Rep. J.J. Pickle as a companion to the bill before us today, S. 828, the Enhanced Oil and Gas Recovery Tax Act of 1989, sponsored by Sen. Domenici, Sen. Boren and others.

The Enhanced Oil and Gas Recovery Tax Act of 1989 provides necessary tax incentives for the removal of crude oil and gas through enhanced recovery techniques and a tax credit for research and development to discover or improve tertiary recovery methods. Promoting the recovery of oil and gas "already in place" will certainly help reduce our dependency on imported oil. This bill will stimulate marginal production, including the development of stripper wells and heavy oil.

While I strongly support the Enhanced Oil and Gas Recovery Tax Act of 1989, I believe that we must do more to put our domestic oil and gas industry back on its feet again. U.S. oil production is below 8 million barrels a day, the lowest level in a quarter century. More than half the drilling rigs operating three years ago are in mothballs or dismantled. In two or three years 50 percent of the oil we consume will flow from foreign rigs, a dependence we have never experienced before.

Unknown to most, oil and gas is one of the most heavily taxed industries in the U.S. The average effective Federal tax rate for U.S. oil companies has been well above that of firms in other industries during the 1980s. Other nations are lowering their taxes on energy production and attracting capital away from the U.S. to develop their resources. If our tax system does not stay competitive, U.S. resources will stay in the ground. Our economy will be the loser and our national security will suffer.

S. 828 is a good first step. However we must do more. My bill, H.R. 658, and Sen. Boren's bill, S. 234, are targeted to provide real help to our struggling independent producers who drill 80–90 percent of all wells in the U.S. Both bills provide a new exploration and development tax credit, a new production credit for marginal well production, removes intangible drilling costs from the minimum tax, extends the non-conventional fuels credit and reinstates tight sands gas qualification for this credit. It also increases percentage depletion, repeals the property transfer rule, and repeals the net income limitation on percentage depletion.

I am cognizant of the challenges that we in the Congress face meeting the deficit reduction targets each year. But we cannot delay. I am working to find a revenue source to pay for these proposals and urge my colleagues in the Senate to do the same. We must enact fiscally responsible legislation which will assist the domestic oil and gas industry. Our economy and our national security depend upon it.

28-414 - 90 - 3

SUBMITTED BY SENATOR DAVID L. BOREN

DESCRIPTION OF S. 828 (ENHANCED OIL AND GAS RECOVERY TAX ACT OF 1989)

(Prepared by the Staff of the Joint Committee on Taxation, JCX-40-89)

INTRODUCTION

The Subcommittee on Energy and Agricultural Taxation of the Senate Committee on Finance has scheduled a public hearing on August 3, 1989, on S. 828, the "Enhanced Oil and Gas Recovery Tax Act of 1989" (introduced on April 18, 1989, by Senators Domenici, Boren, Dole, Nickles, Wallop, Garn, Bingaman, Johnston, McClure, and Gramm). The bill would provide tax incentives for the removal of crude oil and gas through enhanced recovery techniques and a tax credit for research and development to discover or improve tertiary recovery methods.

This document,[1] prepared by the staff of the Joint Committee on taxation, provides a description of S. 828. The first part of the document is a summary. The second part is a description of the bill, including present law, effective dates, and related provisions of the Administration proposal for tax incentives for enhanced oil and gas recovery.

I. SUMMARY

S. 828—ENHANCED OIL AND GAS RECOVERY TAX ACT OF 1989

Senators Domenici, Boren, Dole, Nickles, Wallop, Garn, Bingaman, Johnston, McClure, and Gramm

The bill would increase the percentage depletion rate for domestic oil and gas recovered through enhanced recovery techniques to 27.5 percent, phased-down as the price of crude oil increases above $30 per barrel adjusted for inflation. The bill would also increase the net income limitation on this oil and gas from 50 percent to 100 percent. The alternative minimum tax preferences for percentage depletion and intangible drilling costs (IDCs) would not apply to the deductions attributable to this oil and gas. Further, a 10-percent research and development tax credit would apply to research to discover or improve tertiary recovery methods.

ADMINISTRATION PROPOSAL [2]

The Administration proposal would replace the 50-percent net income limitation with a limitation based on 100 percent of net income in the case of all percentage depletion allowable under the Code. The proposal would allow percentage depletion to be claimed by a transferee of proven oil- or gas-producing property. Further, the proposal would eliminate 80 percent of the present law tax preference attributable to IDCs incurred by independent producers for exploratory drilling. The proposal would also provide a 10-percent tax credit for certain projects utilizing tertiary enhanced recovery techniques.

II. DESCRIPTION OF S. 828

A. ENHANCED OIL AND GAS RECOVERY DEPLETION ALLOWANCE

Present Law

General rules

Certain costs incurred prior to drilling an oil- or gas-producing property are recovered through depletion deductions. Generally, these include costs of acquiring the lease or other interest in the property, and geological and geophysical costs. Depletion is available to any person having an economic interest in a producing property (including a royalty interest, working interest, overriding royalty interest, or net profits interest).

Depletion is computed using whichever of two methods results in a higher deduction: cost depletion or percentage depletion (however, the deduction for percentage depletion is limited to certain taxpayers as discussed below).

Under the cost depletion method, the taxpayer deducts that portion of the adjusted basis of the property which is equal to the ratio of units sold from that property

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[1] This document may be cited as follows: Joint Committee on Taxation, *Description of S. 828 (Enhanced Oil and Gas Recovery Tax Act of 1989)* (JCX-40-89), August 1, 1989.

[2] As contained in President Bush's budget proposal for fiscal year 1990, submitted to the Congress on February 9, 1989.

during the taxable year to the estimated number of units remaining to be recovered at the beginning of the taxable year. The amount recovered under cost depletion cannot exceed the taxpayer's basis in the property.

Under the percentage depletion method, 15 percent of the taxpayer's gross income from an oil- or gas-producing property is allowed as a deduction in each taxable year. The amount deducted cannot exceed 50 percent of the taxable income from the property for the taxable year, computed without regard to the depletion deduction (the "net income limitation"). Additionally, the allowance for percentage depletion cannot exceed 65 percent of the taxpayer's overall taxable income, determined before such deduction and adjusted for certain loss carrybacks and trust distributions (the "taxable income limitation").[3] Because percentage depletion is computed without regard to the taxpayer's basis in a property, cumulative depletion deductions may exceed the amount expended by the taxpayer to acquire or develop the property.

Limitation of deduction for percentage depletion to independent producers, etc.

Under present law, the deduction for percentage depletion for oil and gas properties is limited to independent producers and royalty owners (as opposed to integrated oil companies), for up to 1,000 barrels of average daily domestic crude oil production, or an equivalent amount of domestic natural gas. For producers of both crude oil and natural gas, this limitation applies on a combined basis.[4]

For purposes of percentage depletion, an independent producer is any producer who is not a "retailer" or "refiner." A retailer is any person who directly, or through a related person, sells oil or natural gas (or any product derived therefrom) (1) through any retail outlet operated by the taxpayer or a related person, or (2) to any person obligated to market or distribute such oil or natural gas (or product derived therefrom) under the name of the taxpayer or the related person. Bulk sales to commercial or industrial users, and bulk sales of aviation fuel to the Department of Defense, are excluded for this purpose. Furthermore, a person is not a retailer within the meaning of this provision if the combined gross receipts of that person and all related persons from the retail sale of oil and natural gas (or any product derived therefrom), do not exceed $5 million for the taxable year.

A refiner is any person who directly, or through a related person, engages in the refining of crude oil, but only if such taxpayer and related person have refinery runs in excess of 50,000 barrels on any day during the taxable year.

Percentage depletion is not allowed with respect to the transferee of a transferred proven oil- or gas-producing property. Generally, a proven property is a property that, at the time of transfer, has had its principal value demonstrated by prospecting, exploration, or discovery work.

Explanation of the Bill

Depletion rate for enhanced recovery

S. 828 would provide a 27.5-percent depletion rate with respect to the production of domestic incremental tertiary crude oil and natural gas during the enhanced recovery period. This deduction would be available to all taxpayers (including independent and integrated producers) for an unlimited amount of production. Under the bill, the 27.5-percent rate would be phased-down to 15 percent by one percentage point for every dollar that the taxpayer's average removal price of oil for the calendar year exceeds $30 per barrel.[5] Under the bill, a taxpayer's average annual removal price for any calendar year would be computed by dividing the aggregate dollar amount for which domestic crude oil was sold by the taxpayer during the calendar year, by the taxpayer's aggregate production of such oil.[6]

For purposes of the bill, incremental tertiary oil and gas includes incremental tertiary oil as defined for prior law windfall profit tax purposes (Code sec. 4993(a), using the current Energy Department (DOE) regulations). Under DOE regulations, tertiary recovery techniques include miscible fluid displacement, steam driven injec-

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[3] An amount disallowed as a result of this rule can be carried forward as a percentage depletion deduction in the following taxable year, subject to the 65-percent taxable income limitation for that year.

[4] Certain regulated natural gas, natural gas sold under a fixed contract, and natural gas from geopressed brine is exempt from the 1,000-barrel-per-day limitation.

[5] The $30 per barrel threshold will be adjusted annually for inflation, as measured by the GNP implicit price deflator, beginning in 1991.

[6] As drafted, the bill contains a technical error in the definition of the term "average annual removal price," by defining such term as the aggregate production of crude oil, divided by the aggregate receipts from the sale of such oil.

tion, microemulsion or micellar emulsion flooding, in situ combustion, polymer augmented water flooding, cyclic steam injection, alkaline or caustic flooding, carbon dioxide augmented water flooding, and immiscible carbon dioxide displacement. Reservoir improvements (including infill patterns and pattern conformance) incident to a qualified tertiary recovery project would be treated as a project which is otherwise a qualified tertiary project. Oil and gas produced from nonhydrocarbon gas flooding, tight formation gas, and certain tight formation oil would also qualify as incremental tertiary oil and gas under the bill.

The enhanced recovery period is a period, as determined by a schedule to be published by the Secretary of the Treasury, based on the average period for a project to recover the expenses of the type of project involved for that geographic region. The enhanced recovery period would not end earlier than six months after the publication of the schedule by the Secretary.

The bill would not amend present law treatment applicable to the deduction for percentage depletion by independent producers and royalty owners for property other than enhanced tertiary recovery property. Additionally, the bill generally would not treat barrels of enhanced domestic tertiary oil and gas produced by an independent producer or royalty owner as barrels of oil or gas produced by such person in applying the 1,000-barrel-per-day limitation on such deduction.

Net income limitation

In addition, the bill would increase the net income limitation from 50 percent to 100 percent of net income in the case of depletable property which produces domestic incremental tertiary crude oil or natural gas during the enhanced recovery period.

Effective date

The provision would be effective for oil and gas production after the date of enactment and before January 1, 2010. The provision would apply after December 31, 1999, only to production from a project begun before January 1, 2000. Expansion of a project begun on or after the date of enactment would be treated as a separate project. In the case of production from a project begun on or before the date of enactment, the rate for percentage depletion would be 18 percent rather than 27.5 percent.

Administration Proposal

The Administration proposal would amend present-law treatment of depletion in two respects. First, the proposal would eliminate the 50-percent net income limitation on the deduction for percentage depletion generally, and in its place impose a 100-percent net income limitation. Second, the proposal would allow percentage depletion to be claimed by independent producers and royalty owners on transferred proven oil- or gas-producing property.

B. ALTERNATIVE MINIMUM TAX

Present Law

Depletion

Under present law, the deduction for depletion is an item of tax preference for purposes of the individual and corporate alternative minimum taxes, to the extent that the depletion deduction constitutes excess percentage depletion. Excess percentage depletion is defined as the excess of the taxpayer's allowable depletion deduction for the taxable year with respect to a particular oil- or gas-producing property over its adjusted basis in such property at the end of the year (prior to adjusting the basis for current year allowable depletion).[7]

Intangible drilling and development costs

Under present law, the deduction for intangible drilling and development costs (IDCs) on successful oil and gas wells is an item of tax preference for purposes of the individual and corporate alternative minimum taxes, to the extent that the taxpayer's excess IDCs exceed 65 percent of its net income from oil and gas properties. (Geothermal properties are treated in a similar manner.) Excess IDCs are defined generally as (1) IDC deductions (attributable to successful wells) for the taxable year, minus (2) the amount that would have been deductible in that year had the IDCs been capitalized and recovered over a 10-year, straight line amortization

[7] Additionally for this purpose, the adjusted basis does not include intangible drilling costs attributable to the property that have been previously deducted by the taxpayer.

period. At the election of the operator, the cost depletion method may be substituted for the 10-year amortization schedule in determining the amount of tax preference.[8]

IDCs are not treated as an item of tax preference if the taxpayer elects to amortize such costs over a 10-year period.

Explanation of the Bill

Depletion and IDCs as tax preference items

S. 828 would repeal the treatment of excess depletion and excess IDCs as items of tax preference with respect to domestic properties that produce oil and gas through the use of enhanced tertiary recovery techniques if the average annual removal price of oil for the taxable year is less than $30 per barrel (adjusted for inflation beginning in 1991).[9]

Effective date

The provision would be effective with respect to production, or costs paid or incurred, after the date of enactment and before January I, 2010. Additionally, the provision would not apply to production, or costs paid or incurred, after December 3l, 1999, unless such production or costs are attributable to a project begun before January 1, 2000.

Administration Proposal

The Administration proposal would eliminate 80 percent of the present-law minimum tax preference for IDCs attributable to exploratory drilling incurred by independent producers.

C. RESEARCH AND DEVELOPMENT TAX CREDIT

Present Law

Present law provides for the allowance of a tax credit with respect to certain costs incurred by taxpayers for increasing qualified research activities (the "R&D credit"). The amount of the credit is equal to 20 percent of the excess of current qualified research expenses over the average of such expenses incurred by the taxpayer over the preceding three taxable years.[10] Also, a 20-percent credit is allowed for certain costs incurred domestically for an original investigation for the advancement of scientific knowledge which does not have a specific commercial objective.

Research which qualifies for the R&D credit includes research which is undertaken for the purpose of discovering information which is technological in nature, and the application of which is intended to be useful in the development of a new or improved business component of the taxpayer. Under present law, qualified research can include certain costs incurred with respect to the development of new methods for extracting mineral deposits, including tertiary recovery methods.[11]

Explanation of the Bill

Research credit for tertiary recovery methods

S. 828 would treat any research to discover or improve one or more tertiary recovery methods for domestic crude oil or natural gas as research which qualifies for the R&D credit if the research is based on accepted principles of engineering. The bill would apply the credit for tertiary recovery research separately from the credit for other R&D, including the determination of the three-year base period average applicable to such research. With respect to such research, the credit would be at a 10-percent rate.[12]

Effective date

The provision would be effective for amounts paid or incurred after the date of enactment, and before January 1, 2010. Amounts paid or incurred before the date of

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[8] In addition, for taxable years beginning after December 3l, 1989, corporations are subject to an alternative minimum tax adjustment for adjusted current earnings. In computing adjusted current earnings, IDCs on successful wells must be amortized over the longer of 60 months or the period used by the corporation for financial accounting purposes.

[9] See discussion of oil and gas recovered through enhanced tertiary recovery techniques (A., above).

[10] However, in no event can the three-year base period average be less than one-half of the current qualified research expenses.

[11] See, for example, Rev. Rul. 74-67, 1974-1 C.B. 63.

[12] Under the bill, it is unclear whether such research that would qualify for the R&D credit under present law would be creditable at the present-law rate of 20 percent instead of the 10-percent rate as provided in the bill.

enactment would be taken into consideration in determining base period research expenses.

Administration Proposal

The Administration proposal would provide a 10-percent tax credit for all capital expenditures on projects that represent the initial application of tertiary enhanced recovery techniques to a property. Additionally, with respect to the R&D credit, the Administration proposal would (1) compute the base period amount as an amount equal to 102 percent of the taxpayer's average qualified research expenses for the years 1983 through 1987, indexed for inflation, and (2) allow for an optional credit, in addition to the regular credit, equal to 7 percent of the current year's qualified research expenses in excess of 75 percent of the base period amount.

PREPARED STATEMENT OF SENATOR PETE V. DOMENICI

Mr. Chairman, members of the Committee, thank you for this opportunity to testify on legislation that I believe is essential to America's energy future—S. 828.

I have called this bill the Enhanced Oil Recovery Tax Act of 1989. It is legislation with a very simple goal: Increasing oil production from American wells, wells now in existence.

This is legislation to reduce dramatically our dependence on foreign petroleum. This is legislation to reduce our trade deficit.

In fact, S. 828 does so many good things, Mr. Chairman, that you might wish to approve it right now.

I think it is fair to say that many Americans are worried about the possibility of another giant tanker disaster, like the *Exxon Valdez*. Many Americans are also worried about new exploration offshore of many areas of our coastline.

I see S. 828 as a way to ensure a dramatic expansion of America's at-home oil production in a manner that is sound economically and sound environmentally.

S. 828 accomplishes this worthy goal through the use of a modest Federal tax incentive, one that will produce a major benefit to the American economy. Let me explain.

Oil prices today stand at about $18 a barrel. But I will assume a price of $20 a barrel.

Making that assumption, S. 828 would increase America's oil reserves by 25 percent—at a cost in lost Federal revenues of about 35 cents per barrel.

S. 828 will lead to the production of an additional 6.9 billion barrels of oil, at a loss in Federal revenues *over several decades* of $2.4 billion. Based on my knowledge of Enhanced Oil recovery projects, I expect the revenue cost of these incentives to be very small in the first few years.

Just how much oil is 6.9 billion barrels? Bringing that much oil to the United States from the Persian Gulf would require 5,750 voyages on tankers with the capacity of the *Exxon Valdez* (1.2 million barrels.)

Put another way, every time an *Exxon Valdez* doesn't have to sail to America from the Middle East—and we get the oil instead from wells in Texas or New Mexico or Kansas—the cost in a direct revenue loss under S. 828 would be $400,000. But that same volume of oil would be worth $24 million—$24 million spent in America, not spent in the Middle East and added to our trade deficit.

That sounds like a pretty good investment to this Senator.

But this is the real key: S. 828 will ensure at-home production of oil that otherwise will surely be imported.

My proposal is based on a simple fact: Regular oil recovery techniques leave *65 to 70 percent of the oil in the ground.*

Let me repeat that: When the oil industry drills a well and extracts all that it normally can extract economically, about *two-thirds of the oil is left behind.* The oil is left in the ground because it is uneconomic to pump more than a third of the oil from a typical well in today's market.

Yet the science exists to extract far more oil per well. Unfortunately, those techniques are expensive; they require considerable capital investment beyond what is generally economic under today's tax structure. Most of that oil will not be recovered unless and until the price of oil becomes substantially higher than it is today.

The Department of Energy estimates America's current reserves of oil at 26 billion barrels, assuming $20-a-barrel oil and existing Federal tax policy.

Using the provisions of S. 828, far wider use of the enhanced recovery techniques would occur. These gains do not involve the drilling of thousands of new wells.

Assuming $20-a-barrel oil an additional 428 million barrels could be added to the Oklahoma reserve base; Louisiana would add 302 million barrels; Texas would add 1.9 billion barrels. 122 million barrels would be added in New Mexico. These gains would be achieved simply through far greater productivity from each well existing now, or each well that would be drilled in any event.

And this increase is achieved with no rise in the price of oil to consumers.

Further, S. 828 means new investment and new jobs—American jobs—raising employment in areas of relatively high unemployment. Inevitably, that will produce a ripple effect as economic activity increases, but I have not included any secondary tax revenues in my calculations.

In New Mexico alone, enhanced oil recovery could more than double our recoverable reserves, creating 8,000 new jobs by the year 2000.

If American consumers were to purchase that same 6.9 billion barrels of oil on the world market—as we inevitably will do if we are unable to increase at-home reserves—we will spend $138 billion in foreign markets. And we will watch with some fear as that oil arrives from the Middle East and elsewhere aboard 5,750 tankers the size of the *Exxon Valdez*.

Last year, the gap between what we produced and what we consumed accounted for $35.2 billion or 29 percent of our trade deficit. Experts predict that within 10 years we could have an oil import bill ranging from $150 billion to $200 billion. That amount is greater than our total trade deficit today, raising serious questions about our ability to reduce the deficit.

If this bill were enacted, the United states could reduce the trade deficit by as much as $50 dollars for every dollar the Treasury foregoes through tax incentives for enhanced recovery.

So this bill makes sense economically. S. 828 makes even greater sense from the point of view of America's security and environment.

This is an important opportunity for a nation that is ever more dependent upon foreign energy sources. Imports today account for about 40 percent of oil used in America. They are likely to account for more than half of that oil within a few years.

What do we do about it? The answer to this Senator is quite simple: We encourage the more efficient use of our existing production system.

In closing, Mr. Chairman, allow me to explain the precise provisions of the Enhanced Oil Recovery Tax Act of 1989.

- The bill restores the oil depletion allowance to its historic level of 27½ percent, but only for the "incremental" oil that is pumped as a result of enhanced oil recovery techniques. Under this bill, current law applies to current reserves; the new depletion allowance applies only to the extra reserves produced with the new investment.
- The bill clarifies that a 10 percent tertiary development tax credit will be available for the costs of enhanced oil recovery projects.
- The bill suspends the intangible drilling costs and percentage depletion preferences for the alternative minimum tax so long as the price of oil remains below $30 a barrel. Should the price rise above that $30 figure, much of the benefits I propose would disappear. I am convinced that the a ceiling that is any less than $30 a-barrel would be ineffective and would not accomplish the goals set out in the legislation.

These Enhanced Oil Recovery incentives (the 27½ percent depletion allowance; the AMT holidays and the credit) would not be available once a producer reaches "pay back," i.e. the point where a taxpayer has recovered his investment.

- The bill permits the states to determine which projects would qualify as enhanced oil recovery projects.
- The bill would increase the net income limitation on oil and gas to 100 percent of taxable income.

Since the bill was introduced on April 18, 1988, I have received many comments from industry, the administration and others. Several oil producers have told me that this legislation would increase their domestic reserves by 20 to 30 percent.

Another producer wrote, that "If enacted S. 828 would not only increase current domestic oil and gas production, but also foster new and innovative extraction techniques which would substantially broaden our nation's energy base, bolstering our national security interests."

Since the bill was introduced, the President has put forth the outline of his proposals and I have had the benefit of comments from producers, the various trade groups and academic experts on Enhanced Oil Recovery projects.

I am confident that a $21 phase-out of a 10% credit won't work. Without the depletion allowance on the incremental oil produced we will not bring on-line the type of reserves that we all want to see recovered.

It very well may be that the 10 percent R&D credit in the bill should be replaced with a 10 percent investment tax credit. I do believe that the incentive should be limited to payback and should phase out at $30 per barrel.

While I commend the President's investment tax credit approach, I am convinced that phasing it out at $21 per barrel is far too low of a threshold to have the desired effect of encouraging new enhanced oil recovery projects.

I look forward to working with the Committee and the Administration to arrive at a well targeted set of incentives that will tap this tremendous resource.

Dr. Fisher estimates that the bill would provide incentives worth about $2.00 per barrel, moving effective current prices nearer to the $25 range. Dr. Mankin will urge the Committee to use a investment tax credit. I look forward to hearing their testimony and learning more about this topic.

We have a distinguished group of witnesses today. Joe King gave up house hunting activities to join us. He has been a district manager responsible for Enhanced Oil Recovery projects in my state. I am also pleased that Dave Martin, the Director of the New Mexico Petroleum Recovery Research Center will be providing us with the benefit of his expertise. He will tell us about EOR potential in New Mexico.

Thank you, Mr. Chairman.

PREPARED STATEMENT OF WILLIAM L. FISHER

Mr. Chairman and Members:

I am William L. Fisher, Director of the Bureau of Economic Geology and Chairman of the Department of Geological Sciences at The University of Texas at Austin.

Mr. Chairman, as you know well, since 1985 low and especially volatile world oil prices have set into place trends seriously eroding the U.S. position in oil sufficiency and security. By mid-year 1989, some 40 months after the oil price crash, the U.S. had lost 1.3 MMbbl/day of production capacity from the U.S. Lower 48 states, in dramatic contrast to the stable production achieved in the first half of the decade. With significantly reduced levels of domestic drilling and with Alaska production also heading for decline in the short term, the future loss will be much greater if no action is taken.

Domestic consumption of oil and petroleum products in 1989 will be more than 2 MMbbl/day greater than in 1985. Consumption of petroleum per real dollar of GNP declined for more than a decade through 1985 as energy efficiencies were seized. Since 1985 no increased efficiency has been achieved.

The result of falling production and increasing demand has been an alarming increase in total oil imports into the U.S. At mid-year 1989, total imports had climbed to 8 MMbbl/day, 50 percent greater than in 1985. Total imports now exceed domestic crude production, only the second time in our history has this ominous event occurred. Since 1985, imports from OPEC have doubled; from the Arab OPEC, they have quadrupled.

The principal and telling cost of price volatility and resulting import dependence is the cost to the security of the Nation. The long-term costs of not acting to maintain our energy position dwarf any possible short-term benefits. Imported oil contributes substantially to our increasing deficit in balance of payments; reduced domestic capacity and

increased dependence on imports create the strong likelihood of oil price shocks and debilitating inflation in the 1990's as we experienced in the 1970's; and critically, high levels of import dependency severely hamper the ability of the U.S. to pursue an effective foreign policy.

The trends now underway need not be. The U.S. has the oil resource potential to secure stable domestic production. Indeed, the remaining resource base in oil is precisely that pursued in the late 1970's through the middle 1980's when the severe decline in Lower 48 States production of the 1970's was arrested and production actually increased. In fact, by 1985, the Lower 48 crude oil production level of 7.2 MMb/d was about 2.0 MMb/d more than the level projected by decline of the 1970's. That translates to nearly a 40 percent production response from the resource base in little more than half a decade.

The U.S. has substantial remaining potential. Exploration potential is concentrated in the frontier areas of the Nation and in the thousands of small to moderate size fields onland in the more maturely explored provinces. The Department of the Interior estimates a volume of nearly 50 billion barrels at mean; at lower probabilities the estimate rises to nearly 70 billion barrels. The American Association of Petroleum Geologists earlier this year estimated that at $25 (1986 $) per barrel and with advanced technology and efficiency, 40 billion barrels could be discovered and converted to producible reserves.

But as important as exploration can be to future levels of U.S. oil production, the future hinges critically on our ability to enlarge recovery from already discovered reservoirs, especially in onland areas of the U.S. In Texas we calculate that more than 100 billion barrels remain in reservoirs beyond proven reserves. The Bartlesville Project Office of DOE, utilizing their Tertiary Oil Information System (TORIS), estimates the national volume at 341 billion barrels. The

American Association of Petroleum Geologists estimates that some 62 billion barrels of this remaining volume can be recovered at $25 per barrel (real price) with advanced technology and improved efficiencies. In a report to the Committee on Liquid Fuels Production Technology of the National Research Council, ICF Resources, a private estimating firm, indicates a recovery of about 59 billion barrels at $24 per barrel, again assuming advanced technology.

The resource base pursued in the first half of this decade when Lower 48 production was stabilized is quite like that remaining. In the first half of the 1980's about 90 percent of the onland reserve additions came from improved recovery or reserve growth of existing fields, including intensive field development and tertiary oil recovery.

The resource base is there and significant volumes can be converted to producible reserves if incentives are such as to provide an effective price level within a range of $25 per barrel. S. 828 is on target. My estimate is that it would provide incentives worth about $2.00 per barrel, moving effective current prices nearer to the $25 range; further, it is directed to a large resource target which should result in significant incremental additions.

I recommend, however, that consideration be given to broadening the bill in two areas; each would enlarge substantially incremental reserve additions.

First, while the research and development tax credit provided for in the bill is important to encourage much needed, new recovery research activity, it will likely do little to increase operator investment. If, in addition an appropriately structured investment tax credit, at say 10 percent, were provided, it would effectively double the value of the incentives in the bill thereby leading to increased operator investment and increased production.

Secondly, the response in incremental reserve additions and production could be significantly increased if the

provisions of this bill, along with an investment tax credit, were extended to a recovery category generally labeled advanced secondary recovery.

In the resource base of unrecovered oil in existing reservoirs, there are basically two categories of oil. One is immobile oil or oil residual to water sweep; this is the portion of the resource base requiring classically defined EOR technology and which the bill specifically addresses. The other category is conventionally movable oil or mobile oil. We have estimated that volume in Texas at about 35 billion barrels or about one-third of the remaining unrecoverable oil. The Bartlesville Project Office of DOE estimates a national figure of some 97 billion barrels. Most of this oil resides in geologically complex reservoirs; in fact, there is a rather direct correlation between volumes of unrecovered mobile oil and reservoir complexity. In these very complex reservoirs, recovery of additional mobile oil will require detailed and advanced geological modeling, advanced logging techniques especially for cased holes, detailed geophysical modeling, and strategic drilling of additional field wells as well as strategic flooding. In fact, in many reservoirs at economic limit with primary and standard secondary recovery techniques, including stripper leases, the application of advanced and strategically deployed secondary techniques would provide substantial incremental reserve additions. While advanced secondary recovery is slightly less price sensitive than classical EOR, it is equally dependent on application of sophisticated technology and thorough understanding of reservoir complexity.

The analysis I have seen shows that the provision of S. 828, if augmented with a 10 percent investment tax credit, would, in the $20 to $30 per barrel range, double expected EOR additions without the incentives. My rough estimates are that

advanced secondary recovery, if provided the same incentives, would increase mobile oil additions about 50 percent in the slightly lower price range of about $20 to $25 per barrel. All price ranges used assume they will be considered stable and not heavily discounted for uncertainty attendant to existing price volatility. While the incremental percentage for advanced secondary recovery of mobile oil is less than for EOR, the absolute volume added from advanced secondary recovery would more than double that from EOR, with the same incentives.

There are a variety of ways advanced secondary recovery, which has much in common with EOR, could be distinguished from standard secondary recovery. Qualifying criteria could be, for example, reservoirs with low mobile oil recovery efficiencies even at dense field drilling; reservoirs now 100 percent under standard secondary flooding; reservoirs yielding stripper production levels and obviously at or near economic limit.

I commend the sponsors of this bill for seeking incentives to bolster critically needed domestic production. The two broadening categories I have outlined would even further augment domestic oil reserve additions and help to offset our current production declines.

PREPARED STATEMENT OF KENNETH W. GIDEON

Mr. Chairman and Members of the Subcommittee: I am pleased to have this opportunity to present the views of the Treasury Department regarding the tax implications of S. 828, the "Enhanced Oil and Gas Recovery Tax Act of 1989." The bill would amend the Internal Revenue Code of 1986 (the "Code") to provide incentives for the removal of crude oil and natural gas through enhanced oil recovery techniques.

The bill, as introduced, has three major components: (1) an increased depletion rate of 27.5 percent for domestic oil and gas recovered through enhanced recovery techniques, phased-down as the price of crude oil increases above $30 per barrel (adjusted for inflation); (2) an exception from the alternative minimum tax rules for excess depletion and excess intangible drilling costs ("IDCs") incurred with respect to domestic properties that produce oil and gas through the use of enhanced recovery techniques if the average annual removal price of oil for the taxpayer is less than $30 per barrel (adjusted for inflation); and (3) a 10-percent research and development tax credit for research to discover or improve tertiary recovery methods. In addition, the bill generally would not treat barrels of enhanced domestic tertiary oil and gas produced by an independent producer or royalty owner as barrels of oil or gas produced by such person in applying the 1,000 barrel-per-day limitation on the percentage depletion deduction. Finally, the bill would increase the net income limitation from 50 percent to 100 percent of net income in the case of depletable property which produces domestic incremental tertiary crude oil or natural gas during the enhanced recovery period. The increase would apply to both independent and integrated producers.

As you are aware, the President proposed in his budget for fiscal year 1990 a new incentive program for the oil and gas industry which would provide tax incentives for both the removal of crude oil and gas through enhanced recovery techniques and the exploration for new oil and gas fields. Under the President's proposal, the Code would be amended to: (1) allow a temporary 10-percent tax credit for the first $10 million of expenditures (per year per company) on exploratory IDCs and a 5-percent credit for the balance; (2) allow a temporary 10-percent tax credit for all capital expenditures on projects that represent new application S of tertiary enhanced recovery techniques to a property; (3) eliminate the "transfer rule," which discourages the transfer of proven properties to independent producers and royalty owners; (4) increase the percentage depletion deduction limit for independent producers to 100 percent of the net income of each property; and (5) eliminate 80 percent of current alternative minimum tax ("AMT") preference items generated by exploratory IDCs incurred by independent producers. The temporary tax credits would be phased out if the average daily U.S. wellhead price of oil is at or above $21 per barrel for a calendar year. These proposals would take effect on January 1, 1990. The President's initiative will be detailed in a bill currently under preparation.

The President's proposal and S. 828 share the goal of increasing domestic oil and gas reserves as a means of improving our energy security. While we prefer the proposals outlined in the budget, we believe that alternative proposals, such as S. 828 should be explored. Indeed, S. 828 and the President's program have many similar features. Like the President's proposal, the bill addresses the need to increase the percentage depletion deduction limit, although we would apply the increase to independent producers with respect to all domestic oil and gas projects. In addition, we are encouraged to learn that modifications suggested by Senator Domenici and his staff to S. 828 would limit the amount of the bill's depletion incentive to recovery of investment in a tertiary project and would replace the R&D credit for tertiary recovery methods with a more general credit for capital expenditures on tertiary projects. As modified, either of these provisions would be more closely aligned with the President's proposed tax credit for tertiary projects.

We believe, however, that a tax credit, whether along the lines of the President's proposal or the bill's credit provisions (if modified as suggested), would provide a more effective incentive than the 27.5 percent depletion rate proposal, because the credit corresponds directly to the expenditure. We would not favor providing both a credit and increased depletion.

It is also our belief that oil and gas tax provisions should not be limited to encouraging the reclamation of old fields but also should encourage exploratory drilling. The bill focuses the depletion incentive and tax credit on tertiary recovery projects. The President's program goes a step further and encourages exploratory drilling with a combination of temporary IDC credits, less restrictive rules for the use of percentage depletion and AMT relief. These incentives are targeted particularly to

independent producers, which have historically drilled a majority of our exploratory wells.

In addition to these substantive views, we have several technical comments on S. 828. I will discuss these in more detail after reviewing the provisions of the bill.

PROVISIONS OF THE BILL

Increased Depletion Rate.—Under percentage depletion, 15 percent of the taxpayer's gross income from an oil- or gas- producing property is allowed as a deduction in each taxable year. The amount deducted cannot exceed 50 percent of the taxable income from the property for the taxable year, computed without regard to the depletion deduction (the "net income limitation"). Under present law, only independent producers and royalty owners may use percentage depletion, for up to 1,000 barrels of average daily domestic crude oil production, or an equivalent amount of domestic natural gas. Integrated producers, those that refine or retail oil or gas, must use generally less favorable cost depletion for oil and gas production. Percentage depletion is not allowed with respect to the transferee of a transferred proven oil- or gas-producing property.

Under present law, the cost of certain tertiary injectants is deductible. Such cost includes any cost paid or incurred for a tertiary injectant which is used as part of a tertiary recovery method. A tertiary recovery method is any method enumerated in subparagraphs (1) through (9) of section 212.78(c) of the June 1979 energy regulations. A taxpayer may also use any method approved by the Secretary.

S. 828 would amend section 613A of the Code to permit all taxpayers (including both independent and integrated producers) to use percentage depletion with respect to the production of domestic "incremental tertiary crude oil and natural gas" during the "enhanced recovery period." The depletion rate would be increased to 27.5 percent, the historic rate for oil and gas which was in effect for 43 years until 1969. Under the bill, the 27.5 percent rate would be phased-down to 15 percent by one percentage point for every dollar that the taxpayer's average removal price of oil for the calendar year exceeds $30 per barrel, a ceiling which would be indexed for inflation.

Under the bill, the term "incremental tertiary oil or gas" means production eligible for incentive depletion. The increased depletion rate would be allowed for production of incremental tertiary oil or gas during a limited period, the "enhanced recovery period." The enhanced recovery period would be determined under a schedule published by the Secretary of the Treasury. The schedule would be designed to establish the average period of time necessary for a taxpayer to recover the investment in an enhanced recovery project. The schedule would specify enhanced recovery periods for each type of enhanced recovery project, and would also take into account any variations among regions of the country that might affect the length of the enhanced recovery period. A tertiary project qualifying for accelerated depletion would be defined under the provisions of the now repealed windfall profit tax, with certain modifications.

In addition, the bill would increase the net income limitation from 50 percent to 100 percent of net income in the case of depletable property which produces domestic incremental tertiary crude oil or natural gas during the enhanced recovery period.

The provision would be effective for oil and gas production after the date of enactment and before January 1, 2010. The provision would apply after December 31, 1999, only to production from a project begun before January 1, 2000. Expansion of a project begun on or after the date of enactment would be treated as a separate project. In the case of production from a project begun on or before the date of enactment, the rate for percentage depletion would be 18 percent rather than 27.5 percent.

Alternative Minimum Tax.—Under present law, the deduction for depletion is an item of tax preference for purposes of the individual and corporate alternative minimum taxes, to the extent that the depletion deduction constitutes excess percentage depletion. Excess percentage depletion is defined as the excess of the taxpayer's allowable depletion deduction for the taxable year with respect to a particular oil- or gas-producing property over its adjusted basis in such property at the end of the year (prior to adjusting the basis for current year allowable depletion). The deduction for IDCs on successful oil and gas wells is also an item of tax preference for purposes of the individual and corporate alternative minimum taxes, to the extent that the taxpayer's excess IDCs exceed 65 percent of its net income from oil and gas properties.

S. 828 would repeal the treatment of excess depletion and excess IDCs as items of tax preference with respect to domestic properties that produce oil and gas through

the use of enhanced tertiary recovery techniques if the average annual removal price of oil for the taxable year is less than $30 per barrel, a ceiling which would be indexed for inflation. These provisions would be effective for costs paid or incurred after the date of enactment.

Tax Credit.—Under present law, a credit is allowed with respect to certain costs incurred by taxpayers for increasing qualified research activities (the "R&D credit"). The amount of the credit is equal to 20 percent of the excess of current qualified research expenses over the average of such expenses incurred by the taxpayer over the preceding three taxable years. A 20-percent credit is allowed for certain costs incurred domestically for an original investigation for the advancement of scientific knowledge which does not have a specific commercial objective. There are not any special rules which apply specifically to research relating to tertiary recovery methods. The bill, as introduced, provides that research to discover or improve tertiary recovery methods for domestic crude oil or natural gas will be treated as research which qualifies for the R&D credit if the research is based on accepted principles of engineering. The rules (including computation of base period amounts) would be applied separately to such research activities. The credit percentage applicable to such tertiary research would be 10 percent, rather than the 20-percent credit generally applicable under current law.

DISCUSSION

I would now like to turn to a discussion of the specific provisions of the bill and offer some technical considerations.

Depletion Incentives.—First, it is not clear under the bill, as introduced, whether the amount of percentage depletion will be limited to the recovery of the expenses of the qualified tertiary project involved, a so-called "pay-back" concept, or whether the amount of percentage depletion allowable may be higher than the taxpayer's investment. Proposed section 613A(e)(1)(A) states that the increased allowance for depletion "shall be computed in accordance with section 613." Under current law, section 613 does not have any limitation related to investment in a project. If a "pay-back" limitation on the bill's depletion incentive is intended, the bill should be modified to include such a limitation.

Second, the system of enhanced recovery periods set forth in the bill raises many questions. Proposed section 613A(e)(4) states that the schedule of enhanced recovery periods to be published by the Secretary will be "based on the average period which is required for a project to recover the expenses of the type of qualified tertiary recovery project involved." Rather than reliance on a schedule, we believe that each taxpayer's advanced recovery period should be determined by the actual length of time it takes to recover the taxpayer's investment. In our view, it will be difficult to provide a uniform schedule which treats taxpayers fairly without being extremely complex. The schedule may have to take into account variations in the price of oil, project size, regional variations, and, possibly, differences among major fields or producing areas in the same region. Given the wide fluctuations in oil prices in recent years, it will be necessary to revise the schedule fairly often, resulting in little uniformity in recovery periods and making the law difficult for taxpayers and the Service to apply. In addition, under a uniform schedule, taxpayers whose projects do not conform to the anticipated recovery period may recover significantly more or less accelerated depletion than their actual investment. Taxpayers will have an incentive to try to produce as much oil as possible within the enhanced recovery period, rather than by planning production based upon the field and specific project.

We believe it would not be difficult to define by statute the types of costs eligible for the credit. These types of projects tend to be large, expensive undertakings that taxpayers would normally account for in a comprehensive manner. Limitation of increased depletion to actual investment should not be an excessive burden.

Third, the phaseout provisions need modification. Under the bill, the phaseout with respect to any given taxpayer is dependent on the price at which the taxpayer actually sells oil during the year. While that may be the most accurate manner in which to measure the effect of rising prices on any particular taxpayer, it introduces an unnecessary level of complexity into the system. This is especially true since the phaseout is one percent for each dollar above $30 per barrel. Accordingly, a number of different depletion rates could apply for different taxpayers in a single year. It would be easier to administer the phaseout by tying it to a national price, so that the applicable depletion rate could be determined on a nationwide basis. It might also be preferable to adjust the depletion rate prospectively; thus, any year's depletion rate would be based on the prior year's prices. This would afford taxpayers certainty in planning for any given year.

Finally, the definition of a tertiary project should be updated. For its basic definition of a tertiary project, the bill refers to the now repealed windfall profits tax statute, which in turn refers to obsolete regulations that were issued by the Department of Energy in 1979 and were subsequently withdrawn. While the basic definition provided by this approach may well be reasonable, we believe it would be preferable to provide a definition in the statute. We would be pleased to work with the Subcommittee if it should decide to formulate a statutory definition of a tertiary project.

Alternative Minimum Tax Provisions.—Although the Administration favors modifying the AMT provisions to encourage an increase in domestic reserves, we believe that such relief should be targeted to exploratory drilling, as we have proposed.

We also have a number of technical suggestions with respect to the AMT relief provisions of S. 828. Such relief is completely phased out for any year in which the taxpayer's average selling price exceeds $30 per barrel. As with the bill's depletion incentive, we believe that any such phaseout should be based on national prices rather than on the taxpayer's own selling price for oil. We also believe that the phaseout should be made effective commencing with the year following the year in which prices exceed $30 per barrel. Since this credit is reduced to zero when prices exceed $30 per barrel, taxpayers are entitled to know well in advance whether their investment in tertiary activities will be eligible for the credit.

Tax Credit.—The Administration does not support the concept of an R&D credit targeted specifically to tertiary recovery methods. Under the bill, as introduced, the credit would only be available with respect to research to discover or improve a tertiary recovery method. Furthermore, the credit would be limited to expenses in excess of a base period limitation. We believe that a credit for investment in tertiary projects should be enacted. However, we believe it should be enacted in its own section and should not be made part of the general R&D credit. Furthermore, we believe it should function as an incentive for all investment in tertiary projects, not merely research and development.

We appreciate the opportunity to appear before your Subcommittee to discuss S. 828 and the President's energy proposals. I will be happy to answer any questions you may have about these matters.

PREPARED STATEMENT OF JOSEPH E. KING

I thank Chairman Boren for inviting me to testify this afternoon in support of S 828, the "Enhanced Oil Recovery Act of 1989," sponsored by Senators Domenici and Boren.

My name is Joseph E. King and I am testifying today in my capacity as Texaco U.S. A.'s District Manager for the Hobbs District, which covers the portion of West Texas from Andrews County North through the panhandle and all of New Mexico except the six counties in the northwestern part of the State. Within the District are the producing properties in the Permian Basin having high enhanced oil recovery (EOR) potential from CO2 recovery of tertiary reserves in existing waterflood projects. As District Manager, I am responsible for overseeing all drilling and production operations for Texaco operated properties in this geographic region. This includes reservoir and evaluation engineering applicable to these properties.

Engineers under my supervision have spent more than forty man-years studying the reservoirs and economics of the high potential EOR projects in the Hobbs District. A major project with corporate approval has recently been placed on hold due to declining oil prices. Without incentives such as those contained in S. 828, there will be very few new projects initiated in an environment of $20 per barrel West Texas Intermediate (WTI) oil prices.

The large negative earnings during the early years of an EOR project cause the economic indicators controlling commitment of capital funds to be very pessimistic for WTI oil prices ranging from $16 to $22 per barrel. Projects that are attempted will be reduced in scope and developed over a long time period. Such projects will have little effect on our national developed reserves.

Recent data published by the Oil Compact Commission indicate that even a $24 per barrel WTI price will result in only a limited number of CO2 projects becoming viable. The 1984 National Petroleum Council EOR Study, in fact, defined a large number of potential reservoirs that would not reach a normal corporate "hurdle" rate of return at $32 per barrel WTI oil prices. Economic comparison of projects proposed for the better reservoirs in the Hobbs District indicate the enhancements in S. 828 would cause the proposed projects to become viable. There is still great risk to EOR projects, and industry would have to believe the tax advantages would not be remanded after the capital is committed for the EOR effort to have new life. The

27½% depletion allowance for incremental EOR production, in addition to the bill's other EOR production incentives, would make such production economically feasible whereas today that is just not the case.

There is a sense of urgency associated with the proposed bill resulting from the limited life of currently producing and injecting wells. Many of the existing waterflood projects have wells that are more than 25 years old. Mechanical failure due to external and internal corrosion is causing permanent abandonment of more and more wells each year. A typical CO2 project will require approximately 30% to 40% of the initial investment for workover and redrilling of existing wells. Recent data furnished by the DOE indicate that a 20% redrill requirement at a $24 per barrel WTI oil price would eliminate 50% of the New Mexico EOR potential at a 15% rate of return. I believe that most mature waterfloods have approximately 10% of their wells shut in.

I am very optimistic that the proposed tax incentives in S. 828 would cause the United States EOR production to significantly increase. In fact, the U.S. Department of Energy estimates that passage of S. 828 would increase America's oil reserves by 6.9 billion barrels, assuming $20 a barrel oil. This represents a 25% increase in the current reserves of U.S. oil. The reserves developed will displace millions of barrels of imported oil and benefit all our citizens. I will be glad to answer any questions at this time.

Prepared Statement of Charles J. Mankin

INTRODUCTION

Good afternoon. My name is Charles J. Mankin. I am a Professor of Geology at the University of Oklahoma and Director of the Oklahoma Geological Survey. I have more than thirty years experience in oil and gas geoscience R&D and related public policy. It is indeed a pleasure to appear before the subcommittee to offer testimony supporting Senate Bill 828, the "Enhanced Oil and Gas Recovery Tax Act of 1989." Mr. Chairman, I thank you for inviting me to offer my views. I would also like to thank the principal sponsor of the bill, Senator Domenici, and his staff for arranging for me to receive the Department of Energy's analysis upon which part of the bill is based.

In addition to serving as State Geologist of Oklahoma, I have dedicated a substantial amount of time and effort to urging policy makers at the state and Federal level to implement incentives to stimulate increased domestic oil and gas production. Let me add that my state, Oklahoma, is one which has already passed an incentive at the state level, limited to project payback, and based on an analysis performed by the Interstate Oil Compact Commission with assistance from the Department of Energy's Tertiary Oil Recovery Analysis System (TORIS). I firmly believe that this country needs a coordinated program of state and Federal incentives combined with an integrated cooperative research and development strategy. Such a program could stimulate increased production and reserves in the immediate future. It could also provide the improved geoscientific understanding and advanced extraction technologies that will allow America to resume supplying substantially more than fifty percent of her oil and gas demand and sustain such levels until economic and environmentally sound domestic alternatives are commercialized.

Mr. Chairman, members of the Subcommittee, this bill could go a long way toward achieving that goal. I am deeply gratified by the intent of the bill. I support the intent and I generally support the bill. At Senator Domenici's request, the Department of Energy analyzed a specific set of tax incentive options and reported its findings. However, there are some rather substantial differences between the incentives actually included in the bill and those analyzed by DOE that give me pause. I think the imperfections can be addressed through relatively simple amendment of the bill. If these reservations are appropriately addressed, I could enthusiastically endorse this bill.

Before addressing these imperfections, let me add some basic background information to put this bill into context. I will then briefly explain my understanding of the bill as drafted, its intended effects, and the concerns I've alluded to as to its actual effects. Finally, I would like to address the importance of the bill in the context of a broad Federal energy policy and to offer some specific and general recommendations which I believe will make the bill more likely to achieve its desired effects and play a significant role in our long-term energy strategy.

BACKGROUND

In his remarks introducing this bill on the Senate floor on April 18, Senator Domenici noted that in addition to the broad national impacts of the oil price decline and the resulting deterioration of the domestic production industry, his home state of New Mexico has been particularly hard hit. He noted the decline in New Mexico's production and reserves, and the consequential decline in oil industry employment in New Mexico. It is incumbent upon me today to tell you that my own home state of Oklahoma has also been hard hit, as have Texas, Louisiana, Kansas, Wyoming, and several other states.

Mr. Chairman, I know you are painfully aware of the impacts of the price and production decline in Oklahoma. From 1985 to 1987,—in only two years— Oklahoma's proved oil reserves declined by 18 percent, from about 950 million barrels to less than 800 million. Annual production declined by about the same percentage dropping more than 30 million barrels. That's a drop of about 82,000 barrels per day. While some 60,000 oil industry jobs have been lost in Oklahoma since 1982, more than 20,000 were lost between 1985 and 1987. Annual state revenues from oil production severance taxes declined by more than $110 million, a drop of about 38 percent. And while total production tax revenues from oil and gas have declined by about a third since 1981, gas severance taxes now comprise about two-thirds of the total compared to less than one-third just 10 years ago.

No, New Mexico is not alone in feeling the effects of the price and production decline. Many energy producing states and regions are in the same position. But this is much more than a regional issue. Oil and natural gas are key critical fuels for the nation and will continue to be such for at least the next several decades. Imports now approach 50 percent of U.S. demand. The cost of those imports last year exceeded $40 billion dollars and accounted for almost 30 percent of the trade deficit. Should supplies be interrupted again, or prices jacked up for any variety of political or economic reasons, the entire nation will suffer. The shame of this situation, Mr. Chairman, is that it doesn't have to be this way. America has abundant oil and natural gas resources which, if properly developed, could meet the greater part of domestic demand for decades to come.

A broad range of experts, including the Department of Energy, the Interstate Oil Compact Commission, the National Petroleum Council, the Texas Bureau of Economic Geology, the Energy Research Advisory Board, the Geoscience Institute for Oil and Gas Recovery Research, and my own staff at the Oklahoma Geological Survey (OGS) all agree that after conventional production is completed, America will have left behind more than 300 billion barrels of oil in known reservoirs for the lack of sufficient geoscientific understanding, advanced recovery technology, and price stability to produce it. That's about *two-thirds* of the 500 billion barrels of oil ever discovered in the United States.

As shown in Figure 1, a substantial portion of the remaining U.S. oil resource—some 169 billion barrels—represents the incremental target for enhanced oil recovery (EOR) beyond current proved EOR reserves which total about 4 billion barrels. Tertiary EOR involves the application of chemicals, miscible gases, or heat to extract oil that remains trapped in the reservoirs after conventional primary recovery and secondary waterflooding techniques have reached their economic limits. This is the portion of the remaining oil resource addressed by the bill under consideration today.

ANALYSIS OF "THE ENHANCED OIL AND GAS RECOVERY TAX ACT OF 1989"

Senate Bill 828 seeks to stimulate implementation of a greater number of potential enhanced oil and natural gas recovery projects by improving production economics through tax incentives. As I understand the bill, there are seven key elements to the incentives proposed.

- The bill seeks to stimulate new projects by restoring the 27.5 percent depletion allowance for certain "qualified" tertiary enhanced oil recovery projects.
- The bill leaves it to the states to determine which projects qualify as a tertiary enhanced oil recovery project.
- The bill suspends intangible drilling costs and the percentage depletion allowance as preference items for the alternative minimum tax (AMT) for a defined period.
- The net income limitation for percentage depletion allowance on oil and natural gas is increased to 100% of taxable income.
- The benefits of the legislation apply only to *incremental* oil and gas production—defined in the bill as the oil or natural gas, produced during a defined phase

of operations, which would not otherwise have been produced by primary or secondary recovery methods.

• The bill curtails both the increased depletion allowance and the AMT exemption once the producer has recovered his investment and normal costs or when the average oil price exceeds $30/barrel.

• The bill "clarifies" the tax code to qualify research conducted as part of tertiary enhanced oil or gas recovery projects for research and development tax credit of 10 percent.

INTENDED EFFECTS OF THE BILL

Based on analyses of various combinations of depletion allowances and tax credits under a range of prices from $20/bbl to $32/bbl, prepared by the Department of Energy, this bill is *intended* to stimulate enough new tertiary EOR projects in enough states over the next decade or more, to add some 6.9 billion incremental barrels to U.S. proved crude oil reserves at current ($20/bbl approx.) prices, an approximate 25% increase over current U.S. proved reserves of 26 billion barrels. Production of these reserves would decrease imports, reducing the cost of imported oil, and consequently, the trade deficit, by some $138 billion. Although the revenues foregone by the Federal treasury would total on the order of $2.4 billion over the life of the incentives— perhaps a decade or more—increased jobs and resulting income and severance taxes would cause a sufficient increase in public sector revenues at the state and local level to more than offset the lost Federal revenues. Mr. Chairman, members of the Subcommittee, those are indeed credible and laudable goals.

There is a key factor in the history of this bill that gives me both comfort and confidence in supporting it. The estimated benefits of the Domenici bill are largely substantiated by an analysis performed by DOE's Bartlesville Project Office (BPO) using the Tertiary Oil Recovery Information System (TORIS), an upgraded version of the system used in 1987 by the Interstate Oil Compact Commission to estimate Oklahoma's EOR recovery potential under a range of incentives and technology assumptions, and the system used by the National Petroleum Council in 1984 to analyze national EOR potential. TORIS is a unique asset of the Department of Energy, and provides a critical tool for the formulation and evaluation of public policy, which gives lends the estimates of this bill's likely effects substantial credibility.

Senator Domenici is quite correct in viewing the cost to the Federal treasury as relatively inconsequential given the potential reduction in the trade deficit and the substantially larger net public sector revenues likely to be generated. It is also important to understand that the DOE analysis *does not* estimate any secondary economic effects generated by increased economic activity. It is likely, however, that the real net public sector revenues could be substantially higher given the multiplier effect of dollars being respent and reinvested in the economy, rather than exported to OPEC or other countries.

Mr. Chairman, the benefits of the incentives analyzed in the DOE study—restoration of the 27.5% depletion allowance and provisions for a 10% *investment* tax credit—could be substantial, not only for the nation as a whole, but for the State of Oklahoma as well. DOE's estimates suggest that Oklahoma's proved EOR reserves would more than double, rising from 327 million barrels to 740 million barrels, an increase of over 400 million barrels. Furthermore, the direct economic effects of the incentives would increase revenues to state and local treasuries in Oklahoma by more than $675 million.

ACTUAL EFFECTS OF THE BILL—AS DRAFTED

Having comparatively analyzed the incentives analysis prepared by the Department of Energy with the specific provisions of the bill, one substantial difference is apparent that dramatically alters the likely effects of the bill. Both the DOE analysis and the legislation consider the effects of restoration of the percentage depletion allowance to 27.5% and the implementation of a 10 percent tax credit. However, while the DOE analysis considers an *investment* tax credit, the draft legislation calls for a *research and development* tax credit.

An investment tax credit, when combined with the increased depletion allowance, as shown in the DOE analysis, is likely to have a substantial and synergistic stimulatory effect on implementation of new enhanced oil recovery projects. The R&D tax credit, however, would likely have very little stimulatory effect on implementation or expansion of oil recovery projects. The R&D credit may, indeed, encourage some scientific field tests, pilot projects, or other research critical to future EOR projects. But, it is not likely to have the same stimulatory effect on as large a number of

commercial scale projects as would the investment tax credit considered in the analysis. One stimulates research, the other stimulates investment.

Consequently, the benefits of the legislation being considered today are actually substantially less than those anticipated by the sponsors. In the context of the TORIS analysis, the actual effects would be much closer to those of the percentage depletion incentive case without the added synergistic benefit of the tax credit. They could be marginally higher assuming the R&D credit stimulates a few new pilot projects. As shown in Table I, the benefits of the legislation as drafted are substantially dampened compared to those that could otherwise be achieved through implementation of the investment tax credit.

Table I.—COMPARATIVE ACTUAL VS. INTENDED INCREMENTAL* EFFECTS OF DRAFT INCENTIVES LEGISLATION ($20/bbl CASE—LIMITED TO PAYBACK)

Effect/Benefit	Actual Effects	Intended Effects
	Restored 27.5% Depletion Allowance	Combination Depletion Allowance Plus 10% Investment Tax Credit
Incremental Reserves (Bil Bbls)	1.2	6.9
Cost to Fed Treasury ($ Bil)	1.0	2.4
Trade Deficit Reduction ($ Bil)	23.8	138.0
Net Public Sector Revenues ($ Bil)	0.6	5.4

If passed as drafted, I would expect this legislation to stimulate only about 18 percent—less than one-fifth of the incremental reserves anticipated. Likewise, trade deficit reduction would only reach about $24 billion, about $115 billion less than estimated. And net public sector benefits, though still positive, would reach only about $600 million as opposed to the $5.4 billion anticipated by the sponsors. Still, the cost to the government would be about $1 billion. That's about 40% of the estimated cost of $2.4 billion of adding fully five times more reserves. Clearly, Mr. Chairman, if this bill is to achieve its intended goals at the optimal level, the bill must include the 10% investment tax credit that was an integral part of the benefits calculation provided by DOE's analysis. The R&D tax credit alone simply does not fill the bill. I would highly recommend that an amendment be drafted and adopted to correct this imperfection.

LIMITING INCENTIVES REDUCES FEDERAL COSTS

Now, let me speak in support of other provisions of what I anticipate will be a perfected bill.I wish to commend the sponsors of this bill for responsibly limiting the duration and the magnitude of the incentives. As shown in the DOE analysis, by cutting off the incentives at the point "at which a project has produced and sold enough [incremental] oil to recoup all investments and operating costs associated with EOR production," new projects are still stimulated, but the costs to the Federal treasury are minimized. By limiting these incentives to the point of project "payback," the bill limits the amount of revenues to be foregone by the government. I agree with the DOE analysis and with the sponsors that the marginal amount of additional reserves made economic by providing "incentives for life," as opposed to "incentives to payback," cannot justify the substantially higher cost to the Federal treasury.

The cut-off of incentives at attainment of a $30/bbl oil price is also responsible. Many of the viable enhanced oil recovery projects will have become economic at that price. Allowing incentives to continue beyond that price will stimulate only marginally greater reserve additions at a substantially higher cost per barrel to the Federal treasury. However, this ceiling price would appear to be the minimum acceptable level to maximize EOR recovery. Since most EOR projects require an oil price in the range of $25 to $30 per barrel, a lower cut-off could substantially limit the effectiveness of the incentives.

Mr. Chairman, incentives can be a good thing, but they must be limited if we are to avoid either the appearance or the reality of giving away the farm. I commend DOE for analyzing the limitations to the incentives and I commend the sponsors for including them. The effect of the cut-off provisions is to make what might otherwise appear as a budget-busting giveaway to the oil industry, an impressively responsible bill that is clearly in the national interest.

R&D TAX CREDIT

As I have mentioned earlier, I firmly believe that a program of economic incentives as provided in this bill is critical to attainment of our national energy goals. However, to achieve their maximum benefits to the nation, the incentives need to be offered in combination with a strong public and private sector research program designed to provide the advanced geoscientific understanding and advanced extraction technologies which will allow us to maximize the efficient recovery of our resources.

Private sector oil and gas geoscience R&D efforts targeted at the domestic Lower-48 state onshore resource base have been severely reduced since 1985. Federal efforts have been expanded marginally, but not sufficiently to meet the national need. Clearly, expanded R&D efforts are essential. However, from reading the tax code and the proposed "clarifying" amendments in this bill, I am uncertain as to the benefit of the proposed R&D tax credit. The intent, as I understand it, is to stimulate expanded EOR related R&D, encourage field tests, and promote pilot projects. But, given the existing rules governing these credits, even as amended by the bill, I foresee only relatively minor benefits accruing to some established research entities, and very little stimulation for new R&D efforts, cooperative projects, or field pilots.

A research and development tax credit is an excellent concept and one which I believe Congress should adopt as part of a national cooperative energy program including both incentives and R&D for advanced technologies. But perhaps at this point in the bill, the tax credit provisions should be amended to provide a 10 percent investment tax credit instead of the R&D credit presently considered. *In addition*, a relatively unrestricted 10 percent or 15 percent R&D tax credit for all EOR related R&D would be much more effective than the one proposed.

From the perspective of the State of Oklahoma, let me say that R&D incentives, if adequately devised, could be particularly beneficial. For the recovery of the remaining oil resource in Oklahoma will not be as effectively stimulated by the economic incentives alone as they could be. Oklahoma has a lot of remaining oil resource that is highly amenable to recovery by chemical EOR processes, including polymers, surfactants, and other methods. Even at the $30/barrel incentive cut-off point, though, these processes are still too expensive to be implemented in some reservoirs. A complimentary research program, however, could be undertaken with one of its goals being the improvement of injectants and application technologies to reduce the economic threshold price of chemical EOR projects to the high $20's/barrel range.

As I mentioned above, the Interstate Oil Compact Commission, with some in-kind analytical and database support from the Department of Energy's Bartlesville Project Office, has prepared several recent studies looking at the effects of tax incentives in combination with advanced technologies—beyond the level of technology available today—on the ultimate recovery potential for the nation's remaining oil resource. The IOCC's New Mexico and Oklahoma reports and a similar national analysis have *all* shown a tremendous synergy between a combination of state and Federal incentives and the benefits of advanced technologies.

In Oklahoma, for example, as shown in Figure II, the IOCC's analysis estimated that, even at $20/bbl, technology advances with incentives add almost two and one-half times the incremental reserves as technology advances without incentives. Combined, the state tax incentive and advanced technology add more than 600 million barrels of incremental EOR reserves in Oklahoma. At $24/barrel, the real synergy of technology advances and the recently passed incentive is obvious. Without the state incentive about 100 million barrels of EOR reserves were deemed recoverable. Advanced technology was estimated to add about 420 million barrels of incremental reserves for a total of about 510 million barrels. However, with the incentive, which added about 200 million barrels of reserves, the effect of advanced technology was to add an incremental 600 million barrels of reserves. The synergistic effect of the incentive, working with the technology advances, was estimated to be about 200 million barrels of reserves that would not have otherwise been stimulated, for a total of about 800 million barrels.

Based on this report, in 1986 the Oklahoma legislature passed a law granting severance tax relief to the point of payback. Texas has recently passed its own incentives bill and I understand that the State of New Mexico may be on its way to following suit.

Today, this subcommittee has the opportunity to recommend that the Federal government shoulder its share of the burden and provide the basis for the states and the nation to take advantage of the potential synergies of these combined state-Federal incentives. If amended as I have recommended, this will be a responsible bill, for it stimulates new EOR projects to the point of profitability without giving away

the store. These same synergies can be gained by incentives and focused R&D at the Federal level. I submit that this Congress needs to move far more aggressively toward a focused R&D program to realize the enormous remaining oil recovery potential.

IMPORTANCE OF BILL IN HELPING FULFILL FEDERAL ENERGY POLICY

Mr. Chairman, members of the subcommittee, if this bill is amended to include the 10% investment tax credit and consequently achieve it's intended goal of stimulating substantial new EOR reserve additions, contributing to reduction of the trade deficit, and increasing net public sector revenues, it will fulfill an important part of the nation's energy goals.

- By increasing oil reserves, the bill contributes to the policy goal of providing adequate energy supplies at reasonable prices
- This bill helps the United States "buy time" by helping to provide the essential resources to meet a large portion of national oil and gas demand during the 20 to 30 years it will take to develop, test, construct infrastructure for, and commercialize alternative transportation fuels.
- The bill also helps buy time in another way. America's hundreds of thousands of stripper wells are being abandoned because of a combination of dwindling production and low oil prices. With the loss of these wells, America loses economic access to much of the remaining oil resource that is currently the target for the advanced technology and knowledge that could stem from a focused R&D program. To the extent that new EOR projects employ these wells and defer their abandonment, America retains access to the resource base, buying time to perform essential R&D.
- To the extent that the bill encourages domestic production and reduces imports, the amount of capital exported for foreign oil will be limited. Instead, that capital will be invested in America, by Americans, for America's benefit.
- The bill is highly complementary to a two-pronged policy of economic incentives to stimulate production immediately, while performing focused geoscience and extraction research to provide advanced EOR technologies and improve process economics for future projects.

Finally, Mr. Chairman, I would like to say that this bill can be highly effective, if modified to include the investment tax credit, in stimulating enhanced oil and gas recovery projects. I wish to remind you all, however, that the immobile oil portion of the remaining oil resource—the EOR target—is only part of the entire remaining oil resource base. Today were are talking about incentivizing reserve additions of about 6.9 billion barrels. Educated assessments of the total recovery potential from the entire remaining oil resource base suggest that as much as 60 to 100 billion barrels of reserves could ultimately be added with the appropriate combination of tax policies and coordinated R&D.

I urge this Subcommittee to amend, adopt, and report this bill to the full committee— including a 10 percent investment tax credit. And I would strongly urge your colleagues in the House of Representatives to follow suit. I would further recommend that you work with your colleagues in the Senate and in the House and with the Administration to adopt a coherent national energy policy that includes a combined program of economic incentives and focused R&D to meet our nation's future needs.

It is an honor to have had the opportunity to express my views before this subcommittee and I thank you for your kind invitation. I would be happy to respond to your questions.

Figure 1

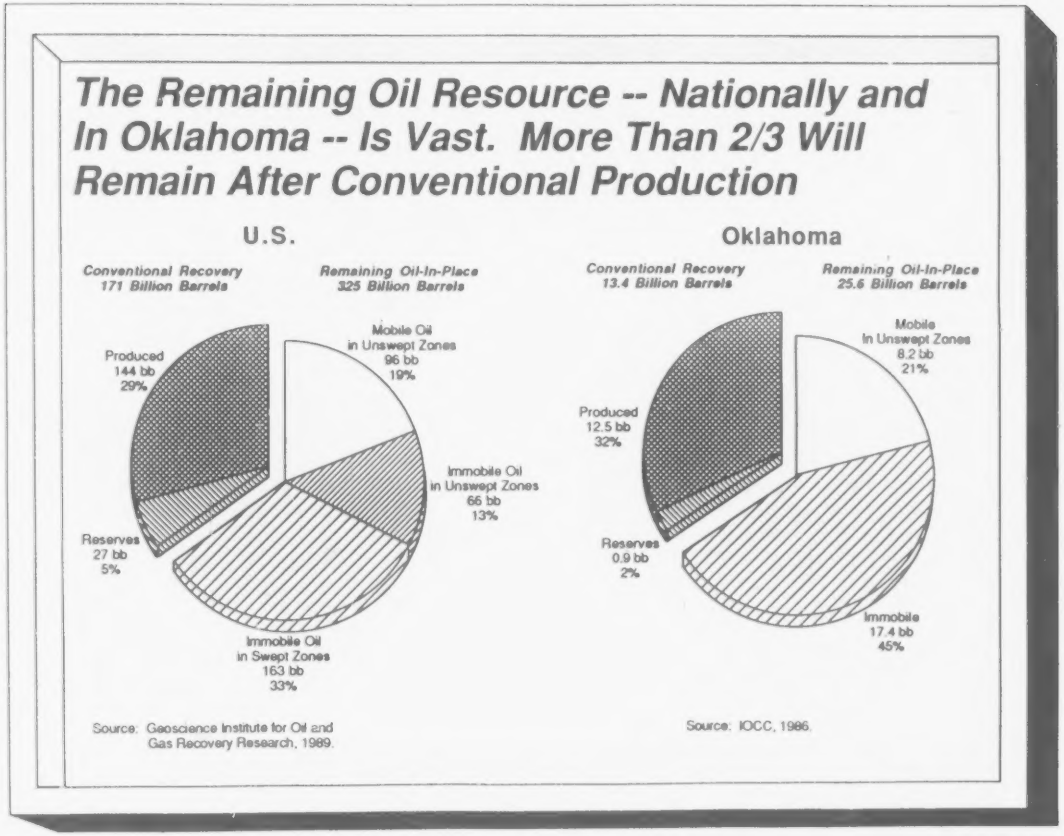
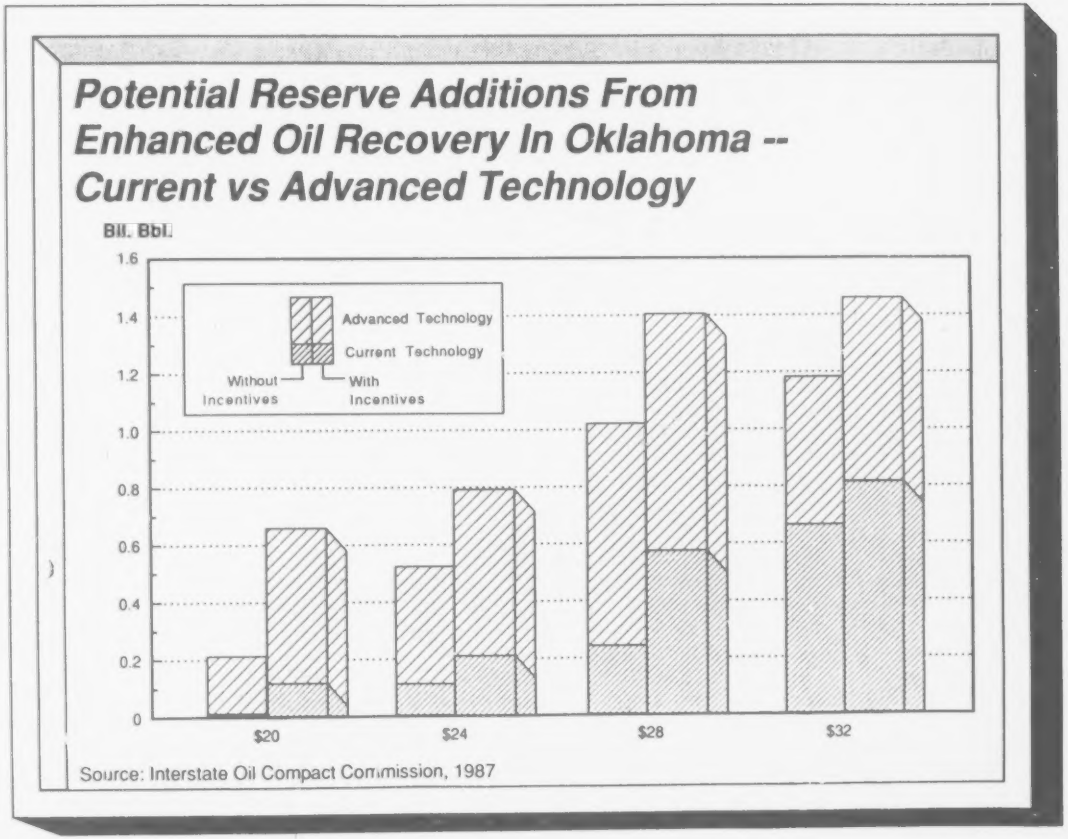

The Remaining Oil Resource -- Nationally and In Oklahoma -- Is Vast. More Than 2/3 Will Remain After Conventional Production
U.S.
Conventional Recovery 171 Billion Barrels
Remaining Oil-In-Place 325 Billion Barrels
Produced 144 bb 29%
Mobile Oil in Unswept Zones 96 bb 19%
Immobile Oil in Unswept Zones 66 bb 13%
Reserves 27 bb 5%
Immobile Oil in Swept Zones 163 bb 33%
Source: Geoscience Institute for Oil and Gas Recovery Research, 1989.
Oklahoma
Conventional Recovery 13.4 Billion Barrels
Remaining Oil-In-Place 25.6 Billion Barrels
Produced 12.5 bb 32%
Mobile In Unswept Zones 8.2 bb 21%
Reserves 0.9 bb 2%
Immobile 17.4 bb 45%
Source: IOCC, 1986.

Figure II


Potential Reserve Additions From Enhanced Oil Recovery In Oklahoma -- Current vs Advanced Technology
Bil. Bbl.
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
Advanced Technology
Current Technology
Without Incentives
With Incentives
$20
$24
$28
$32
Source: Interstate Oil Compact Commission, 1987

Prepared Statement of F. David Martin

ABSTRACT

Approximately two-thirds of the crude oil that has been discovered in the United States (over 300 billion barrels) remains in known reservoirs after conventional primary and secondary recovery operations. Unless immediate and positive actions are taken, the U.S. will become increasingly dependent on foreign sources of oil with significant impacts upon the nation's balance of trade, economy, and security. Improved technology is needed to maximize domestic oil production from known U.S. reservoirs by identifying oil that may be recovered with advanced methods. However, improved technology alone will not add significant oil and gas reserves in the current economic situation. Properly structured economic incentives are essential to encourage the recovery of a significant portion of the 300 billion barrels of crude oil that will be permanently lost otherwise. A properly structured incentive will provide the required economic incentive to make a *substantial* impact on oil recovery by advanced techniques at costs that are affordable to the public treasuries. The long term consequences of not taking this action will greatly outweigh the benefits of currently low oil prices. Indeed, the survival of the domestic oil industry is at stake. Because of the importance of tax and royalty income to the oil producing states, measures to increase or sustain revenues from oil and gas are strongly encouraged.

This testimony is offered in support of Senate Bill 828, "The Enhanced Oil and Gas Recovery Tax Act of 1989." The enclosed text presents information on the importance of enhanced oil recovery with particular emphasis on New Mexico. The proposed legislation will encourage the implementation of new enhanced recovery projects and the expansion of existing ones. As structured, the proposed legislation has the potential of significantly increasing revenues to states such as New Mexico, especially at low oil prices. Since the depletion allowance only applies to the incremental EOR production, it is limited to project payout, and it phases out at oil prices above $30 per barrel, a well-conceived piece of legislation. A possible improvement could be the inclusion of a 10% Investment Tax Credit in addition to the Research and Development Credit. An investment tax credit will attract outside capital to the industry which would be very beneficial, especially to the smaller independent producers.

INTRODUCTION

Good afternoon, Mr. Chairman and members of the Subcommittee. My name is David Martin and I am Director of the New Mexico Petroleum Recovery Research Center, a division of the New Mexico Institute of Mining and Technology in Socorro New Mexico. I have been involved in the oil and gas industry for nearly thirty years, a time of numerous technical and economic changes. I appreciate the opportunity to appear before the subcommittee today to offer testimony in support of Senate Bill 828, the Enhanced Oil and Gas Recovery Tax Act of 1989. Additionally, I wish to thank Senator Domenici, the principal sponsor of this bill, and his hard-working staff for providing me with the analysis which was used in preparation for this bill and which was performed by the Department of Energy's Bartlesville Project Office. The Tertiary Oil Recovery Information System (TORIS) used by Bartlesville to perform this analysis has proven, on numerous occasions, to provide accurate and reliable information.

The bill under consideration today would provide tax incentives to the oil and gas industry in order to stimulate an increase in enhanced oil and natural gas recovery projects and an expansion in existing projects. As director of a research center which is directly involved with enhanced oil recovery, this is obviously a subject that concerns me greatly. New Mexico, as well as other states, has been hit hard in the area of revenue from oil and gas production. Decreased oil prices led to decreased production in the state as well as decreased revenues from sales. Some companies went out of business in the state and others reduced their workforce significantly, resulting in increased unemployment. Therefore, I am delighted that the Senate is considering a bill that would alleviate some of these economic problems. As structured, the proposed legislation has the potential of significantly increasing revenues to states such as New Mexico, especially at low oil prices. It would also have a beneficial impact on the workforce of these states, returning to work those who were previously employed in the oil and gas industry as new and expanded state projects create an increased demand for these skilled workers.

THE NEED FOR ENHANCED OIL RECOVERY

For most of this century natural gas and crude oil have been plentiful sources of cheap energy. However, the decreases in oil price over the last few years have caused production decreases in the U.S. In 1987, about 16 million barrels of crude oil.were consumed per day. Since the domestic supply was only about 10 million barrels, more than 35% of the crude oil used in this country was imported from foreign sources. This percentage has increased to approximately 50% and is projected to reach 55% in the year 2000 (EIA, 1988). Because of the energy dependence of the U.S., this situation has become a national security issue. In addition to the security problems involved, crude oil imports have added considerably to the U.S. trade deficit [more than $40 billion in 1987] (Dept. of Commerce, 1988).

Since most of the large oil and gas fields in the U.S. have already been discovered, much of the exploration and production research effort in this country is directed toward recovering more oil from known reservoirs by enhanced recovery methods. Generally, enhanced recovery can be divided into three broad methods: gas injection methods, chemical methods, and thermal methods. The gas methods include hydrocarbon miscible flooding, nitrogen and flue gas flooding, and carbon dioxide flooding. The chemical methods consist of polymer flooding, alkaline flooding, and surfactant flooding (or some combination of several or all types of chemicals). Thermal methods include in-situ combustion (or fireflooding) and steamflooding. Research on these various methods is being done by both the private sector (oil companies, service companies, and private research laboratories and companies) and the public sector (funded by Federal and state governments as well as other Federal agencies.)

Of the approximately 500 billion barrels of crude oil that have been discovered in the U.S., about 139 billion barrels of oil had been produced as of January 1986, and 28 billion barrels are listed as proved reserves. The remaining oil in place after conventional primary and secondary recovery is estimated to be approximately 66% of the original oil in place. This means that about two-thirds of the original oil in place will remain in known reservoirs in the U.S. after conventional primary and secondary recovery operations.

Petroleum resources potentially recoverable by enhanced oil recovery (EOR) techniques may be on the order of 45 billion barrels. Currently, production from EOR operations accounts for about 7% of the total domestic production or about 15% of the crude oil that is imported in the U.S. However, if incentives to produce this oil are not forthcoming almost half of the oil existing in known reservoirs will remain in the ground.

EOR POTENTIAL

In 1984, the National Petroleum Council issued a report entitled "Enhanced Oil Recovery" at the request of the Secretary of Energy. For the base case that was studied in this report ($30 per barrel crude oil price and 10% minimum rate of return), recovery from EOR in the U.S. was expected to produce 14.5 billion barrels of oil from technology that is already available (Implemented Technology). For the reservoirs that were both technically and economically feasible for production purposes (containing 132.3 billion barrels), this EOR recovery represented 11% of the original oil in place. As shown in Table I, the amount of oil recovered by EOR is sensitive to oil price; predicted recovery is also given for advances in technology.

A 1986 study was conducted by the Interstate Oil Compact Commission entitled "The Potential of Enhanced Oil Recovery by Carbon Dioxide Flooding in New Mexico." Data from that report showing the effect of oil price on EOR in New Mexico is given in Table 2. For similar conditions as in the prior NPC report ($32/bbl crude oil price and 10% ROR), the incremental recovery is also 11% of the original oil in place for the reservoirs that were economically attractive. Additionally, Figure 1 shows the estimated New Mexico oil recovery for conventional production and for carbon dioxide flooding as a function of oil price. The IOCC report concluded that properly structured incentives can offset the production decline in New Mexico, even at low oil prices. To optimize revenue to the State of New Mexico, the report recommended that the incentives apply until project payout rather than for the life of the project.

EFFECT OF WELL ABANDONMENT ON THE POTENTIAL FOR CO2 FLOODING IN NEW MEXICO

The data on New Mexico reservoirs that are contained in the New Mexico Research and Development Institute report number NMRDI 2-74-4806, "The Potential of Enhanced Oil Recovery by Carbon Dioxide Flooding in New Mexico," were used to study the effect of abandonment of existing wells on CO2-flooding potential in New Mexico. The same database that was in the original study was used to assess

the impact of redrilling 20%, 40%, 60%, and 100% of the existing wells on the incremental oil production that could be recovered by CO2 flooding. This redrilling would be required if a significant number of wells, usually marginally economic producers, but necessary to implement the enhanced recovery project in the future, had been abandoned prior to the initiation of CO2 flooding.

Analysis of the data indicates that the abandonment and redrilling of even a small percentage of 20% of the existing wells would reduce potential reserves obtained from CO2 flooding by more than 50%, depending on oil price. The loss in CO2-obtained reserves for the 20% redrilling scenario would amount to 50, 198, 500, and 395 million barrels for oil prices of 24, 28, 32, and 40 dollars per barrel, respectively. Shown in Figure 2 is the even greater impact of redrilling 40% and 60% of the existing wells.

Although the results only pertain to New Mexico reservoirs, similar effects are expected for reservoirs in other states as well as for other EOR methods. If even a small percentage of existing wells are plugged and abandoned, a significant amount of future reserves from EOR will be lost forever and even more foreign oil will be imported into the U.S. which will further increase our trade deficit. Therefore, effective action must be taken immediately to preserve the existing wellbores in order to maintain access to the remaining oil in reservoirs that are targets for advanced recovery methods.

EFFECT OF FEDERAL INCENTIVES ON EOR

At the request of Senator Domenici, the Bartlesville Project Office of the Department of Energy evaluated the effect of several Federal income tax incentives on oil reserves and revenue for the oil producing states and for the Federal Government. Results of that analysis indicate that the incentives should be allowed to project payback as indicated in the prior New Mexico study on state incentives. For the combined 10% Tax Credit (Investment) and 27.5% Depletion Allowance to Payback, substantial increases in EOR reserves and state revenues were projected. As shown in Table 3, at low oil prices, the EOR reserve additions and revenue in New Mexico would approximately double; the benefits were not as great at higher oil prices.

DISCUSSION OF S.B. 828

As the above analysis indicates, S.B. 828 has the potential to cause a significant increase in EOR activity. Since the incentives only apply to incremental production that otherwise will not be produced and are phased out at higher oil prices, the proposed legislation will provide the needed stimulus at a modest cost to the Federal treasury. As written, S.B. 828 provides for a research and development tax credit which would stimulate research activities. However, the analysis considered an investment tax credit which would be desirable in that it would stimulate investment and would attract badly needed capital for projects that are noted for high front-end expenses. Therefore, I recommend that the Subcommittee consider the addition of a 10% investment tax credit to the R&D credit presently in the bill. An alternate approach would be to expand the special rules for research on page 10 to include "(I) any research to discover, improve or implement . . . "

With the above revision, I urge the Subcommittee to adopt this bill which can have a significant impact on the ability of this nation to continue to have a reliable and inexpensive source of energy to meet our future needs.

Thank you for the opportunity to present my views before this Subcommittee. If you have questions, I will be pleased to respond.

Table 1.—EFFECT OF OIL PRICE ON EOR IN THE U.S.

[EOR, billion bbls]

Oil Price $/bbl	Implemented Technology	Advanced Technology
20	7.4	
30	14.5	27.5
40	17.5	31.9
50	19.0	34.0

Table 2.—EFFECT OF OIL PRICE ON EOR IN NEW MEXICO

[EOR, million bbls]

Oil Price $/bbl	10% ROR	15% ROR
16	20	10
20	50	30
24	160	100
28	620	350
32	750	670
36	790	710
40	820	790

Talbe 3.— EFFECT OF S.B. 828 ON OIL RESERVES AND REVENUE IN NEW MEXICO

[EOR Reserve Additions, million bbls]

Oil Price. $7bbl	Current Taxes	S.B. 828
20	122	244
24	282	688
28	640	867
32	743	1037
[Revenue to New Mexico, million dollars]		
20	254	456
24	717	1525
28	1866	2329
32	2474	3184

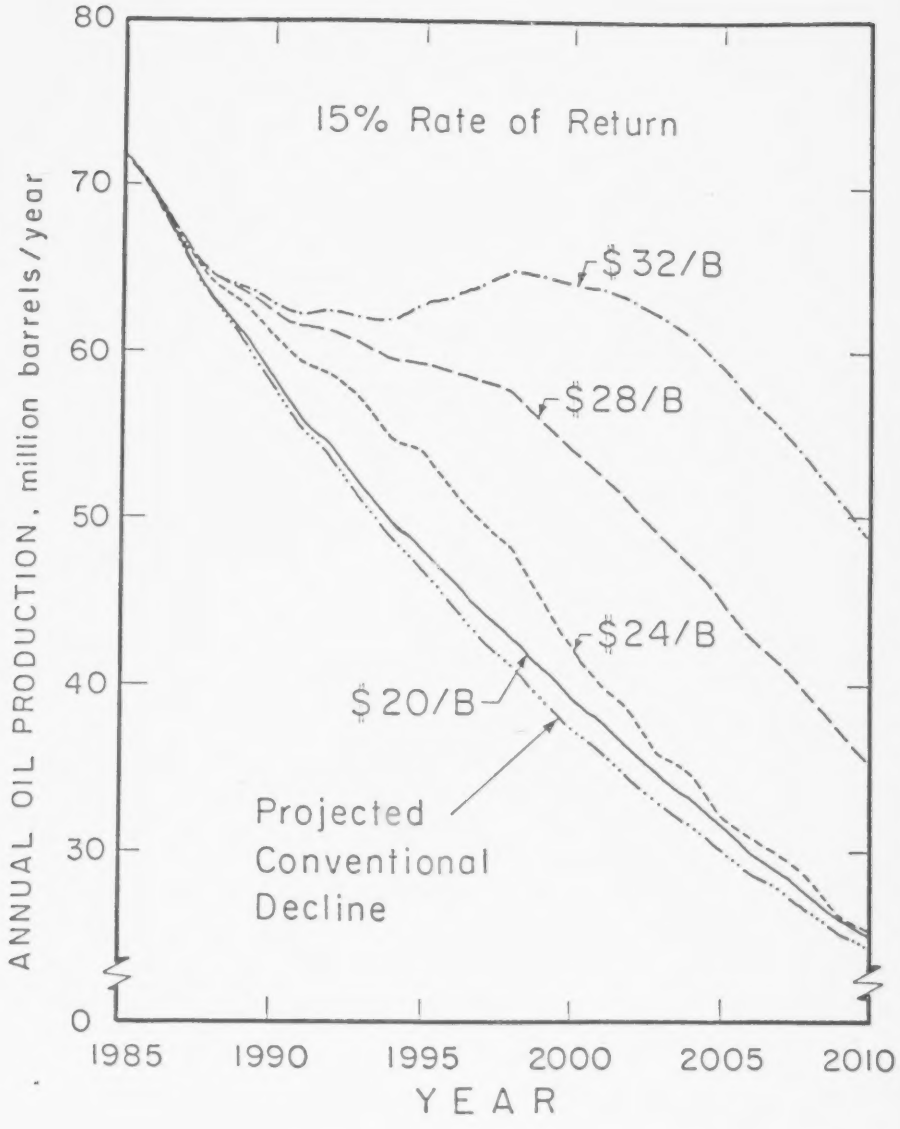


Figure 1. Impact of CO_2 Flooding on Oil Production in New Mexico.

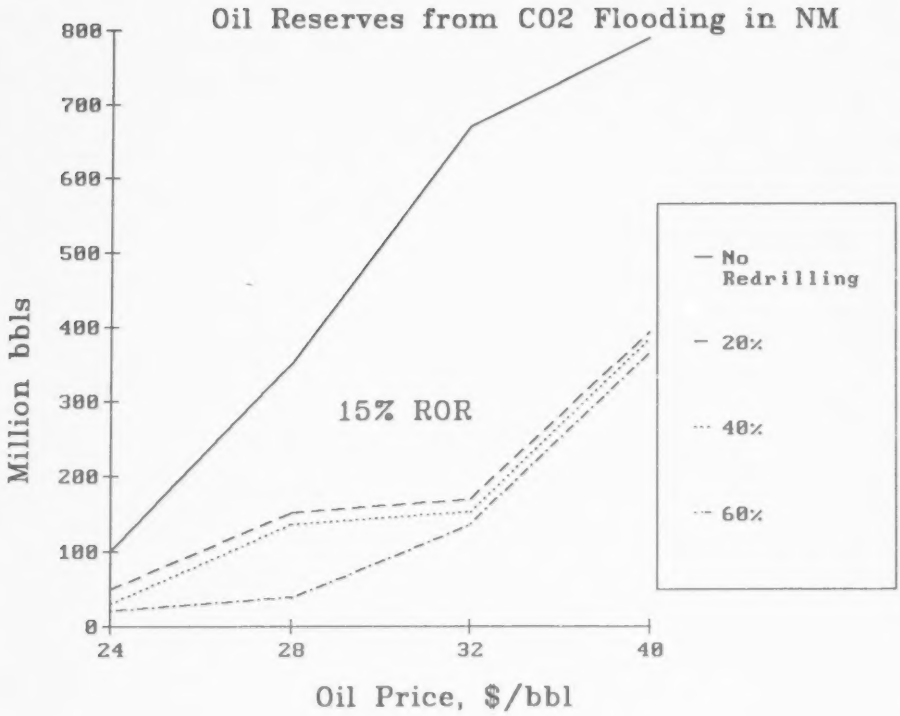

Oil Reserves from CO2 Flooding in NM
800
700
600
500
400
300
200
100
0
Million bbls
15% ROR
No Redrilling
20%
40%
60%
24
28
32
40
Oil Price, $/bbl

Figure 2

Prepared Statement of John S. Sharp

ENHANCED OIL RECOVERY INCENTIVE PROGRAM

I appreciate the opportunity to be with you today. I'd like to share with you information on our new enhanced oil recovery incentive program. This is the first severance tax relief program ever passed in the State of Texas and we're proud of it. Let me tell you why this program is important not only to the people of Texas but also to the entire nation.

First, some 45 percent of the oil consumed in the United States is imported. When we talk about the health of the domestic oil industry, we re also talking about the health of the nation and national security concerns.

Second, some 23.6 percent of the nation's crude oil production is from Texas. In fact, if Texas were a member of OPEC, we'd be producing more than 10 of the 13 OPEC member countries.

This will give you an idea of how much Texas was hurt in the price collapse of 1986. And, in place of "Texas" in that statement you might substitute the name of any number of states, including the home states of some subcommittee and Finance committee members.

We in Texas have been seeing our severance tax collections drop as well as income to our public schools and universities from leasing of state lands. This is not only because of lower oil prices but also because of lower production. While drilling efforts have dropped drastically, new enhanced recovery projects have also declined. The capital costs are just too high and the prospect of low price oil toe strong to take the risk.

Enhanced recovery projects are important to our state. Over half of our production, 54.6 percent in 1987, comes from these projects. Texas has some 4,200 active secondary projects and 30 tertiary projects.

In newly discovered fields, there is usually a natural drive of water or gas in the reservoir that pushes the oil to the producing well. This allows the producer to get along with only minimal operating expenses. After a while though, that natural drive becomes negligible and the oil no longer flows naturally into and up the well. Then, the producer must equip the well with a pumping mechanism which lifts the oil up to the surface. The expenses rise with the added cost of electricity or fuel and servicing equipment.

At some point along here, many producers will sit down and look at the total at the end of the column of their operating expenses. They'll compare this to the price they're getting for a barrel of oil. What they see makes them close the accounts book and say "I can't do it any more."

For the state and the nation, this is a loss of tax income and natural resources. It is estimated that the production up to this point, the primary recovery production, accounts for about 20 percent of all the oil in a reservoir. Unless the rate of production can be increased by moving beyond primary production methods, all of the remaining oil will be, in effect, wasted because it is not recovered.

When enhanced recovery is used, though, it could mean that another 20 percent or more of the total oil in place can be recovered.

Our tax relief program encourages more of these enhanced recovery projects. These projects take money. Whether the project uses waterflooding as secondary recovery or one of the tertiary methods such as steam injection or carbon dioxide miscible flood, the investment outlay is huge. While we, as a state, can't affect the price for oil that the operator will receive if the project is initiated, we can affect the operating cost side of the equation. This is done by providing severance tax relief.

Our program promises that any producer undertaking a new enhanced recovery project on or after this coming September 1st may only have to pay a severance tax rate of 2.3 percent. This is one half the rate that is normally applied to the value of oil produced in Texas.

Are we going to lose tax income for the state by doing this? We don't believe so. First, we believe this relief is going to mean oil which may have stayed in the ground will now be produced. Directly, it will mean additional oil severance tax income, even if only at a 2.3 percent rate. This rate will go back to 4.6 percent in 10 years. It will mean severance tax being paid at the full rate of 7.5 percent on casinghead gas that wouldn't have been produced otherwise. It will mean additional royalties for our educational system. Indirectly, it will mean increased employment in the industries that service the projects, that transport the production, and that refine that oil. All along the line, there is a ripple effect that enhances local and other state tax revenues. These positive effects will not occur if that potentially recoverable oil stays in the ground.

To qualify for our tax relief the operator applies for approval of a project in a designated area. Project operation begins with initial injection into the oil reservoir. When a positive production response is established, the operator applies to the Commission for response certification. A positive response can be an actual upward turn in what was previously an established rate of decline in production. It can also mean that a rate of decline has been arrested. Secondary projects have up to 3 years after project approval to get this response. Tertiary projects have up to 5 years.

The operator then takes the Commission-issued certificate of project approval and area designation along with the certificate of positive production response to our State Comptroller of Public Accounts. As the collector of Texas taxes, that office will implement the enhanced oil recovery tax rate.

We see this severance tax relief as a win—win situation for a critical industry, for the state of Texas, and for the people of Texas. We believe you may find a tax relief program at the national level providing similar widespread benefits. This has been recognized at the Federal level in the past in connection with windfalls profit tax relief for tertiary projects.

We strongly recommend that Federal tax incentives be developed for enhanced recovery projects, secondary as well as tertiary.

Now, I'll be glad to answer any questions you have.

COMMUNICATIONS

AMERICAN PETROLEUM INSTITUTE,
Washington, DC, August 2, 1989.

Hon. PETE V. DOMENICI,
U.S. Senate,
Washington, DC.

Dear Senator Domenici: The American Petroleum Institute appreciates your long-standing interest in and commitment to developing a sound National Energy Policy. Your efforts to achieve this policy are especially needed now in view of the high level of imported petroleum, currently at 47 percent of total domestic petroleum deliveries, and the steep and prolonged decline in domestic petroleum production.

Your sponsorship of S. 828, the "Enhanced Oil and Gas Recovery Act of 1989," along with Senator Boren and other members of the Senate, moves toward promoting the development of domestic energy resources. Enhanced oil recovery projects are an important method of obtaining additional production from proven reserves which would not otherwise be available. As you so clearly recognize, the difficulty with these projects is that they are extremely expensive in that they require costly enhanced recovery techniques.

The approach which S. 828 takes would be an important step towards overcoming current obstacles for enhanced recovery for both existing wells and new projects. The incentive could be utilized immediately.

The American Petroleum Institute has worked closely with Congressmen Archer and Andrews and Senator Boren in developing H.R. 664 and S. 449 which include a combination of tax credits and other incentives which would, if enacted, also help to stimulate domestic oil and natural gas exploration and production. S. 828 complements these proposals as it would stimulate recovery of known domestic reserves.

We will be submitting our detailed comments on the technical aspects of S. 828 for the record of Senate Finance Committee hearings to be held on August 3, 1989.

We appreciate your interest and support.

Sincerely,

CHARLES J. DIBONA, *President.*

Attachment.

STATEMENT OF THE AMERICAN PETROLEUM INSTITUTE

INTRODUCTION

The American Petroleum Institute (API) submits this statement for the record of hearings of the Senate Finance Subcommittee on Energy and Agricultural Taxation, regarding S. 828, the Enhanced Oil Recovery Act of 1989, held August 3, 1989. The API is a national trade association serving about 6,000 individual and over 200 corporate members engaged in all facets of the petroleum industry. API welcomes this opportunity to submit testimony regarding S. 828 because the effort to develop incentives that will stimulate domestic petroleum production is both timely and important.

API believes that a comprehensive package of tax incentives is needed to reduce the level of decline of domestic oil and gas production and halt the nation's dependence on foreign imports. S. 828, which provides certain incentives for enhanced oil and gas recovery, would be a valuable element of such a package. While S. 828 is not without some technical problems which are discussed below, it does begin to address one of the areas that has been lacking in our domestic energy policy—getting the most out of our proven reserves. We applaud the effort by Senator Domenici,

this Committee and other concerned members of Congress in working to strengthen our nation's energy policies.

S. 828—"ENHANCED OIL AND GAS RECOVERY ACT OF 1989"

The bill is composed of three main elements—a percentage depletion allowance for production of tertiary domestic crude oil and gas, removal of the treatment as preference items for all depletion and intangible drilling cost deductions associated with incremental tertiary projects, and allowance of a 10% credit for qualified research expenditures that would discover or improve tertiary recovery methods. API believes that the combination of these three provisions, with the modifications described below, can be an important element of a national energy policy.

The percentage depletion allowance would allow a deduction of up to 27.5% for production of incremental tertiary crude oil and gas. In the event that the taxpayer's average annual removal price of crude oil exceeds $30 (adjusted for inflation) there would be a 1% reduction of the percentage for every dollar that price was exceeded up to 15%. We believe that using the taxpayer's records to determine the average annual removal price would lead to enormous complexity and uncertainty, and would be difficult to administer.

The bill allows the percentage depletion deduction to continue until the taxpayer has recouped his incremental tertiary costs. Such a "pay-back" period would be established by the Secretary after enactment of the legislation and would be based upon the average amount of time it would ordinarily take to recover such expenses. Start-up of any new projects will be unnecessarily delayed if taxpayers are forced to wait for the Secretary to make his determinations regarding recovery periods. A taxpayer cannot commit to a costly enhanced recovery project until he can determine the economic return from the project. Therefore, if the legislation is to have an immediate impact on our dwindling reserves through enhanced recovery projects, it is essential that the appropriate recovery periods be established in the legislation so that at the time of enactment taxpayers can immediately begin to plan projects.

It is important to note that while the allowance of this deduction is beneficial, the large up-front costs of such projects coupled with the net income limitation on percentage depletion greatly reduces the amount of the benefits, particularly in the early stages of the recovery period. Often a considerable amount of time and expense must be incurred before a tertiary project reaches its productive capacity. While income levels are low, expenses are at their highest. The combination of these elements could push a project through its recovery period before it had the opportunity to enjoy any benefit. For this reason, it is essential that along with the allowance for percentage depletion an investment credit be enacted.

S. 828 proposes a ten-percent credit for qualified research expenses for any research to discover or improve one or more tertiary recovery methods for domestic crude oil or gas. In order to achieve the production goals that S. 828 seeks to achieve, API believes that there should be an investment credit for all qualified tertiary expenditures. Such a credit would ensure that taxpayers would receive some benefit in the early stages of the projects and would substantially increase the viability of these projects.

The final component of the legislation is the elimination of percentage depletion and IDC deductions from preference treatment for minimum tax purposes. Although API fully supports this provision, we again believe that for the reasons set forth above, the use of the taxpayer's average annual removal price to limit this treatment is not appropriate.

THE NEED FOR ENHANCED OIL RECOVERY

The amount of crude oil that will be abandoned in already discovered fields is staggering. A recent study published by the Society of Petroleum Engineers placed that figure at roughly twelve times our current proved reserves. Nearly two-thirds of the oil ever discovered in the U.S. will remain in reservoirs due to the lack of technologies to produce them economically. While under current technology only a portion of these additional reserves could ever be reached it is clear that given sufficient economic stimulus a significant amount of this resource can be produced.

The ability to obtain these reserves has been proven. An Oil & Gas Journal survey showed that the number of EOR projects in the U.S. declined from 512 in 1986 to 366 in 1988. Despite this 28% decrease in the number of projects production during that same period rose from 604,786 to 637,453, an increase of 5.4%.

The time to pursue this production is now, as the U.S. is becoming dangerously dependent on foreign oil at the same time that domestic consumption is increasing.

THE RISE IN PETROLEUM IMPORTS AND U.S. CONSUMPTION

During the past three years, there have been dramatic reversals from previous U.S. oil demand and supply trends. From the late 1970s through the mid-1980s, U.S. oil consumption fell substantially while domestic production rose modestly. Consequently, U.S. gross oil imports fell from a peak of 8.8 million barrels per day (MMBD) or 48 percent of consumption in 1977 to 4.9 MMBD or 31 percent of consumption in 1985. These trends, however, were reversed after 1985, reflecting the fall in world oil prices that began in the early 1980s and accelerated sharply in 1986. Between 1985 and 1988, annual U.S. oil consumption rose by 1.6 MMBD while annual domestic production (including natural gas liquids) fell by 0.8 MMBD. As a result, U.S. gross oil imports rose from 4.9 MMBD in 1985 to 7.4 MMBD or 43 percent of consumption in 1988.

The trends toward greater domestic oil consumption and smaller production continued in early 1989. In the first half of this year, U.S. oil consumption was about 111,000 barrels per day higher than in the comparable period of 1988, while oil production including natural gas liquids was down by about 480,000 barrels per day. Moreover, Alaskan production recently has fallen below year-earlier levels, which may well be the start of a reversal of the upward trend in Alaskan production that had lasted for several years.

So far this year, U.S. oil imports have exceeded the level of domestic crude oil production. Natural gas liquids output and other smaller domestic supply components keep the supply balance tipped toward the domestic side. Nevertheless, July's gross oil imports accounted for 50.4 percent of domestic consumption, not only higher than the 42 percent average for full year 1988 but also far above the 31 percent level recorded in 1985. The vast majority of the increase in imports during the past three years or so has come from OPEC producers with the bulk of that from the Middle East, reflecting the geographic distribution of worldwide incremental production capacity.

LIKELY FUTURE TRENDS IN U.S. OIL MARKETS

The important question is whether these trends are likely to continue, making the U.S. more and more dependent on imported oil, or whether they can be influenced by public policy decisions. Developments in oil markets over the past few years provide considerable information as to what is likely to happen under existing policy. Following is a brief review of this information.

An important leading indicator of future U.S. oil production is domestic capital expenditures for exploration and production. The American Petroleum Institute regularly compiles data on such expenditures by a group of leading oil companies. These companies' expenditures for domestic exploration and production peaked in 1981 at $26.3 billion. They fell by 25 percent to $19.8 billion by 1985, as world oil prices and oil company profitability declined. Although this decline in investment was severe, it was much milder than the falloff that was to follow when world oil prices plummeted after 1985. By 1987, capital expenditures for domestic exploration and production had fallen to $9.6 billion, only about half their 1985 level and one-third of their 1981 level. Although upstream investment increased in 1988 over the depressed 1987 level, such investment still was far below the levels of a few years ago.

Since drilling and related costs have fallen substantially in recent years, trends in capital spending for exploration and production may not tell the full story of what is actually occurring. Drilling rig activity and well completions, however, corroborate the story told by the capital expenditure data. The number of drilling rigs operating in the U.S. recently has been in the 750-850 range, compared to 1,969 in 1985 and 3,970 in the peak year of 1981.

Consequently, the number of oil and natural gas wells completed in the U.S. has plummeted. Less than half as many wells were completed in 1988 as in 1985 and only about one-third as many as in 1981. Oil well completions have fallen by about 60 percent in the last three years, while natural gas well completions have declined by about 48 percent.

Oil reserve additions have been suffering as a result of the price fall and decline in oilfield activity. Reserve additions in the lower 48 states fell from 2.9 billion barrels per year for the two years before the 1986 price collapse to 1.0 billion barrels in 1986 and 2.0 billion barrels in 1987. Thus, despite the drop in oil production and the booking of additional reserves in Alaska as projects there were completed, total U.S. crude oil reserves fell from 28.4 billion barrels at the end of 1985 to 27.3 billion barrels at year end 1987 (the latest government data available).

Furthermore, the U.S. no longer has the vast natural gas excess deliverability capability that it had in the mid-1980s. U.S. consumption of natural gas increased in 1987 and 1988, after declining by about 26 percent between 1973 and 1986. The U.S. Department of Energy now expects U.S. demand for natural gas to grow by about 14 percent through the year 2000. Yet, natural gas development has slowed substantially in the U.S.; gas well completions fell from a peak of about 20,000 in 1981 to only about 7,300 last year, and U.S. natural gas reserves declined every year during the 1981-1987 period. Indeed, the Department of Energy expects U.S. natural gas production to grow more slowly than demand during the next decade or so, causing U.S. imports of natural gas as well as oil to rise.

All this obviously does not augur well for future U.S. oil production. Projections by private organizations as well as government authorities look for a continued production decline over the longer term as well as the near term, with the speed of the decline dependent upon the future course of oil prices.

Increased U.S. demand for imported oil will strengthen the OPEC cartel and make it more likely that oil prices will rise in the future. The United States is a large net importer of oil, and thus the nation's real income is reduced when oil prices rise. Greater import dependency will also increase the risk of damage to the U.S. economy should there be a significant cutoff of oil supplies anywhere in the world. In addition, growth in oil imports worsens the U.S. trade balance.

All this makes it essential that wise public policies are followed. There is a great deal that the Federal Government can do to slow the rise in imports and thereby improve our nation's and indeed the free world's energy security and economic well-being. The failure to take the steps that can and should be taken will result in becoming even more dependent on imports than we need to be. Prompt government action, on the other hand, could substantially increase the amount of domestic oil and natural gas found and developed by the early 1990s and produced from then until well beyond the year 2000. To do so, government should act now to encourage greater energy exploration and development. Increased leasing of Federal lands and the avoidance of unnecessarily costly regulatory requirements all would be helpful. In addition, changes in Federal tax policies can make an important contribution toward providing a more secure energy future.

API POSITION ON ENERGY INCENTIVES

In view of the disturbing energy trends discussed above, the American Petroleum Institute believes that a comprehensive package of tax incentives is needed to halt the decline in our domestic oil and gas production. Such a program would have a significant positive impact on domestic petroleum production, slowing the decline in such production. And, an increase in domestic petroleum production above the levels it otherwise might fall to would have important economic benefits—as well as national security benefits—for the U.S. and for other importing nations as well.

First, greater U.S. petroleum production will reduce the future demand for oil on world markets. Historically, the world oil price has been responsive to changes in demand. Less demand from the U.S., the world's largest oil importer, can exert significant downward pressure on world prices. Thus, greater U.S. production in response to tax changes is likely to reduce the price of future oil imports.

Second, on the supply side, reduced U.S. reliance on oil imports creates greater slack in world oil markets. When there is unused oil producing capacity around the world, there is less opportunity for a single nation or small group of nations intentionally to disrupt world oil supplies and thereby raise the world oil price. Thus, by increasing domestic oil production, the U.S. not only can hold down the world oil price in normal periods but also reduce the chances that a physical disruption of supply would sharply raise the price. Furthermore, the damage to the U.S. economy from a foreign oil supply disruption probably would be reduced if the U.S. is less import dependent.

Third, to the extent that increased domestic petroleum production requires the use of specialized labor and equipment that otherwise would be unemployed, increased U.S. petroleum production will raise employment of labor and capital. Moreover, tax incentives will help keep the industry's infrastructure (i.e., specialized manpower and facilities) in place, so that the industry can expand with fewer bottlenecks in the future.

Fourth, lower U.S. expenditures for oil imports will improve the nation's international trade balance.

Finally, to the extent that energy tax incentives cause greater employment and higher national income, the Federal tax base and tax revenues will rise. Under these conditions, there will be at least a partial offset to any loss of Federal revenues associated with the provision of energy tax incentives.

CONCLUSION

In conclusion, the API believes that if our nation is to change direction and take steps to ensure a strong energy policy, a comprehensive package of incentives, similar to S. 449 introduced early this year by Senator Boren, is needed. That legislation contains:

- 20% exploration & development credit
- 20% production credit
- elimination of IDC & percentage depletion as preferences
- seven-year extension of non-conventional fuels credit
- allows for full expensing of IDC and includes G&G and surface casing costs in IDC definition
- repeals the net income property limitation and extends the taxpayer net income limitation to 100%
- repeals the transfer rule
- exempts all oil & gas exploration and development activity from 263A treatment
- allows for amortization of offshore dismantlement costs during the production period of the asset

The provisions contained in S. 828 would be a valuable addition to these proposals and would be an important first step in addressing our nation's energy needs.

STATEMENT OF THE INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA

The Independent Petroleum Association of America (IPAA) is a national association which represents independent crude oil and natural gas explorers/producers in all 33 states with oil and natural gas production. There are some 12,000 independent producers of crude oil and natural gas who form the backbone of the domestic petroleum industry. The IPAA welcomes the opportunity to comment on S. 828, a bill to provide tax incentives to recover oil and natural gas through enhanced recovery methods.

The need for a comprehensive national energy policy is almost universally acknowledged. Increasing U.S. production should be one of the objectives of any comprehensive national energy policy. It doesn't take a year-long study to know that the easiest, fastest and most economical means to increase U.S. production levels is to develop and maintain those U.S. oil and natural gas reserves already "in-place." S. 828 encourages the extraction of existing oil and natural gas reserves that are recovered through "enhanced oil recovery techniques." These techniques are expensive and are not always economical in today's current *price and tax structure. Further, if the wells are allowed to be plugged and abandoned now, EOR projects would not be economical in the future due to the cost of drilling new wells.*

INCENTIVES TO MAINTAIN MARGINAL PRODUCTION

While the IPAA supports the policy objectives of S. 828, the bill should address another important source of U.S. reserves—marginal oil and natural gas wells. There are economical tax policy measures which, if adopted, would slow the premature abandonment of marginal wells and the related loss of U.S. reserves. Once a well is plugged and abandoned, it cannot be re-opened, and the drilling of a new well to a formation known to produce stripper-level production would not be economical. The IPAA strongly encourages the adoption of S. 1565 introduced by Senator Robert Dole (R-KS), as a companion bill to S. 828. S. 1565 adopts economical tax policy measures that would slow the premature abandonment of domestic marginal oil and natural gas wells. The bill would repeal the transfer rule and increase the 50 percent property net income limitation to 100 percent. Additionally, with respect to production from marginal wells the bill would: eliminate percentage depletion as a tax preference item, repeal the 65 percent taxpayer net income limitation and eliminate the 1000 barrel per day limitation.

REPEAL OF THE TRANSFER RULE

Currently only 1000 of barrels per day of independent production qualifies for statutory depletion. Integrated oil companies cannot claim statutory depletion at all. Further, under current law, statutory depletion cannot be claimed after proven properties have changed ownership. The repeal of the transfer rule would permit independent producers to use statutory depletion on properties purchased from integrated producers.

The repeal of the transfer rule would encourage the more cost efficient independents to purchase marginal properties from integrated companies and thus prolong the life of U.S. marginal reserves. Repeal of the transfer rule would add to Treasury revenues in the short term. The additional cost depletion deductions of the independents would be spread out over a number of years while the gain on the sale would be taxable immediately. Further, an income generating asset is maintained.

However, repeal of the transfer alone would not provide the necessary incentive to keep our marginal properties producing. Additional depletion modifications that would significantly encourage the more cost efficient independents to purchase, rework and maintain marginal properties would include eliminating statutory depletion as a preference item on marginal production and the repeal of other limitations imposed on statutory depletion.

ELIMINATE MARGINAL DEPLETION AS AN ITEM OF TAX PREFERENCE

Most independent explorers/producers are currently feeling the pinch of the alternative minimum tax due to depressed industry conditions and the fact that their constant capital outlays are subject to preferential treatment.

As a consequence, tax policies to modify the depletion rules to encourage the stimulation and maintenance of already discovered domestic reserves, should address the alternative minimum tax. The elimination of excess depletion attributable to marginal oil and natural gas wells as a tax preference item would insure that tax benefits would accrue to the independent marginal oil and gas well operator.

50 PERCENT NET INCOME LIMITATION

Allowable depletion is the greater of cost or percentage, and as any oil and gas property acquisition would entail some reasonable purchase price, allowable depletion deductions would, more than likely be cost depletion. This would be especially true with marginal properties that have high operating costs due to the 50 percent of net income limitation which limits the amount of statutory depletion to 50 percent of net income from the oil & gas property. For example, assume that an independent purchased an oil property for $10,500 based on the following economic assumptions:

- Initial production will average five barrels a day and then decline at an average rate of six percent per annum.
- Removal value is held constant at $15/bbl.
- Costs will average $12/bbl and escalate at a six percent rate.

If the aforementioned economic assumptions hold true, then the well will cease economic production at the end of four years, and the independent's depletion deduction would have been computed as follows:

DEPLETION COMPUTATION

YR.	BBLS	Value	Operation costs	Net income	15 percent of gross	50 percent limit	Percent depletion	Cost of depletion	Depletion sustained
1	1825	27,375	21,930	5,475	4,106	2,738	2,738	2,830	2,830
2	1734	26,006	22,053	3,953	3,901	1,976	1,976	2,689	2,689
3	1647	24,706	22,208	2,498	3,706	1,249	1,249	2,554	2,554
4	1565	23,471	22,363	1,108	3,521	554	554	2,427	2,427

As the example illustrates, the independent does not receive any benefit from statutory depletion due to the interaction of cost depletion and as the 50 percent of property net income limitation. What is needed to provide an additional economic incentive for independents to purchase and maintain marginal production is to eliminate the 50% percent of net income limitation, or, at a minimum, set the limitation at a 100% of net income.

65 PERCENT OF NET INCOME LIMITATION

Modification of the 50 percent limitation does not in itself assure that the independent will be able to the sustain the deduction on his tax return because of an additional limitation imposed at the taxpayer level. This tax rule limits the amount of sustainable depletion to 65 percent of the taxpayer's net income. Most independent oil & gas explorers/producers have large, unusable depletion carryforward

amounts as a result of this limitation. In order for the depletion modifications to be an effective incentive for the independent to purchase and maintain marginal production, the taxpayer level limitation should be repealed with respect to depletion attributable to marginal production.

1,000 BARREL LIMITATION

The 1000 barrel limitation acts to diminish and in some instances eliminate any benefit of statutory depletion for the larger independents. For example, the statutory depletion rate for an independent with 5,000 barrels of average daily oil production is 3 percent and not 15 percent. The rate is computed by dividing the 1000 barrel allowable by total production and then multiplying the result times the depletion rate (1000/5000 x .15). Obviously the larger the independent the further the erosion of the statutory depletion rate until it reaches a point where many large independents don't even compute statutory depletion. The elimination of the 1000 barrel limitation with respect to marginal production would insure that the marginal production depletion incentives would also accrue to the benefit of the larger independent.

AGGREGATE EFFECT OF S. 1565

Adoption of S. 1565 would significantly encourage the smaller independent to purchase, rework and maintain marginal oil and natural gas wells. The cost of the bill to the Treasury would be offset in part, if not totally, from additional Treasury revenues resulting from property sales between integrated and independent producers. In addition, the adoption of S. 1565 would also contribute to increase drilling activities by making marginal drilling prospects more economically attractive. For example, S. 1565 would enhance the economics of drilling prospects whose production levels are expected to quickly deteriorate to stripper well levels.

In summary, S. 1565 is a natural companion bill to S. 828. The bill is partially, if not totally, self-financed, and it would encourage the maintenance of marginal oil and natural gas wells, as well as encouraging new drilling activities.

S. 828-SPECIFIC COMMENTS

(1) RESEARCH AND DEVELOPMENT TAX CREDIT

S. 828 provides for a research and development tax credit for any research to discover or improve one or more "tertiary" recovery methods for domestic crude oil or natural gas. We believe that a research and development credit as proposed by S. 828 would have a negligible impact *in stimulating the recovery of domestic reserves. We believe that a 10 percent tax credit for all capital expenditures invested in "enhanced" oil and natural gas projects would provide a much more meaningful incentive for producers to recover additional crude oil and natural gas through artificial means.* The 10 percent tax credit would act in synergy with the proposed changes to statutory depletion on incremental production to create a powerful incentive to invest in "enhanced" oil and natural gas recovery projects.

(2) DEFINITION OF QUALIFYING PRODUCTION

Only incremental tertiary production as defined by the now repealed windfall profit tax code sections would qualify for the increased statutory depletion allowances. Reduced windfall profit tax rates were accorded to incremental production from tertiary projects as defined in the 1979 DOE Regulations. These reduced tax rates were adopted as an incentive to recover oil through tertiary techniques at a time when the price of crude oil was bumping $40 a barrel! We believe that if the true purpose of the bill is to maximize the production of domestic crude oil at a time when crude oil imports are high and oil prices are low, then we must divorce ourselves from definitions developed in the past to address quite different economic conditions.

The definition of "enhanced" oil and natural gas recovery techniques should not be limited to tertiary recovery techniques as defined by the 1979 DOE regulations. "Enhanced" recovery techniques should also include secondary oil recovery techniques. A workable definition of "enhanced" *recovery is contained in The Alberta Oil and Gas Conservation Act* as follows:

> [T]he increased recovery from a pool achieved by artificial means or by the application of energy extrinsic to the pool, which artificial means or application includes pressuring, cycling, pressure maintenance or injection to the pool of a substance or form of energy but does not include the injection in a well of a substance or form of energy for the sole purpose of (i) aiding

in the lifting of fluids in the well, or (ii) stimulation of the reservoir at or near the well by mechanical, chemical, thermal or explosive means.

We specifically recommend that increased statutory depletion be available for all enhanced oil and natural gas recovery techniques such as incremental secondary production. Further, secondary recovery capital investments should also qualify for a 10 percent investment tax credit. We would be more than happy to work with the committee to aid in the re-drafting of the definition of "enhanced" oil and natural gas recovery techniques.

(3) ENHANCED RECOVERY PERIOD

S. 828 provides that the depletion incentives are to end once a producer's costs to implement the enhanced oil and natural gas project have been recouped by the tax incentives provided under the bill. The bill requires the secretary of Treasury to issue average recovery schedules to be used by all taxpayers in lieu of the actual recoupment period of the individual taxpayer. In light of the fact that it would be extremely difficult to develop a standardized schedule that would *treat all taxpayers fairly, we recommend that the actual recovery period for each individual taxpayer be used to determine the cessation of the tax incentives provided by the bill.* The adoption of this recommendation would also assure producers that the tax benefits under the bill would permit sufficient recoupment their capital investment.

(4) PHASE-OUT

Under the bill, tax incentives are phased out as the price of oil exceeds certain levels. The phase-out is determined by the average annual removal value for each taxpayer. While we agree that the dollar phase-out mechanism should be tied to the oil price received by each producer during the year so as to account for regional price differences, *we recommend that any depletion rate reduction be determined at the beginning of the year based on the preceding year's average annual removal value.* This would provide the taxpayer with certainty to aid in financial planning.

NIJECT SERVICES COMPANY,
Washington, DC, August 21, 1989.

Ms. LAURA WILCOX,
Hearing Administrator,
Senate Finance Committee,
Washington, DC.

Mr. ED MIHALSKI,
Minority Chief of Staff,
Washington, DC.

Reference: S. 828 The "Enhanced Oil Recovery Act of 1989"

Dear Madam and Sir: Nject Services Company hereby requests that this letter serve as a written statement to be included in the printed record of the hearing that began on August 3, 1989 on a bill (S. 828) to provide tax incentives to boost domestic energy exploration.

Nject Services Company is a joint venture of subsidiaries of Ingersoll-Rand Company and Union Carbide Industrial Cases Inc. Nject sells compressed gaseous nitrogen to oil producers for injection into their reservoirs in miscible, immiscible and other incremental tertiary recovery applications. The gaseous nitrogen is produced in Nject owned and operated cryogenic air separation plants located at the oil producers' oil fields. Nject currently owns and/or has under construction eight (8) such cryogenic nitrogen plants and has active contracts to supply a minimum of 184 MMSCFD of nitrogen to oil producers.

We support the intent of bill S. 828, but believe it is not sufficiently clear in qualifying an immiscible gas flood, using nitrogen as the injectant, as a tertiary recovery method. We believe that the bill sponsors certainly intends such qualifications per Sec. 2 Article (e)(3)(A)(iii) wherein it reads "(iii) nonhydrocarbon gas flooding, . . . shall be treated as meeting the requirements of section 4993(c)(2)(A), and, . . ."

The potential for misinterpretation relates to the fact the term "tertiary recovery method" mentioned in 4993(c)(2)(A) of the Windfall Profits Tax (WPT) Act is formally described in 4993(d)(1)(A) as, "any method described in subparagraphs (1) through (9) of Section 212.78 (c) of the June 1979 energy regulations." However the June, 1979 energy regulations were subsequently amended in October, 1979 to correct and change several provisions including 212.78(c)(9) and the WPT Act makes no mention of this fact. The 212.78(c)(9) June, 1979 wording, "immiscible carbon dioxide dis-

placement" was changed in the 212.78(c)(9) October 1979 amendments to, "Immiscible non hydrocarbon gas displacement." This change was made following public hearings on the energy regulations and analysis by the engineers of the Department of Energy. Unfortunately for nitrogen, the Congress used the original DOE June, 1979 energy regulations without referencing the October 1, 1979 amendments when writing the Windfall Profits Tax Act. Although this oversight was being reviewed by the engineers of the IRS and was identified by Niject, Exxon and others at public IRS hearings held in 1985, the subsequent collapse of oil prices in early 1986 postponed indefinitely any action to correct and/or change several provisions of the Windfall Profits Tax Act. One such provision was the use of the June, 1979 212.78(c) regulations, without including reference to the October, 1979 amendments, with respect to the definition of a tertiary recovery method.

Therefore, to make absolutely clear the intent of bill (S. 828) and as a simple and appropriate resolution of our concerns- we propose that an additional subparagraph between Sec. 2(e)(3)(A) (iii) and (iv) be added to read:

> The term "tertiary recovery method" means any method which is described in subparagraphs (1) through (9) of Section 212.78(c) of the October 1, 1979 amendments to the June, 1979 energy regulations.

We appreciate the opportunity to express our views and hope they will be given due consideration.

Very truly yours,

D.E. KROLL, *President.*

ORYX ENERGY COMPANY,
Washington, DC, July 27, 1989.

Hon. DAVID BOREN, *Chairman,*
Subcommittee on Energy and Agricultural Taxation,
Senate Finance Committee,
U.S. Senate,
Washington, DC.

Dear Senator Boren: We would like to provide you with our comments on S. 828, the "Enhanced Oil and Gas Recovery Tax Act of 1989" which has been offered by Senator Domenici and others. First, we strongly support this important legislation for the industry and the nation.

This Bill would significantly improve the economics of existing enhanced recovery projects and clearly provides added incentives for undertaking new tertiary recovery production. At this time such incentives are needed to maintain current production and increase future production from known reserves.

In order to improve the efficiency of the incentive provided by this Bill, we hope that you will consider the following comments. Under the Bill, percentage depletion can be claimed on incremental tertiary oil or gas production during the "enhanced recovery period" to be published by the Secretary of the Treasury based upon average payback periods for different types of projects.

The "enhanced recovery period" should be defined in the Bill as a minimum period of 5 years with a provision that such period could be lengthened by the Secretary of the Treasury for projects with a longer average period to recover the expenses of the type of project involved. This certainty of a minimum 5-year period would permit the incentive provided by the Bill to operate effectively from the date of enactment.

The 10 percent credit provided by the Bill would apply to research to discover or improve tertiary recovery methods. If it is the Bill's intention to provide the credit for the field application of existing tertiary techniques in commercial projects, which do result in increased knowledge and improvements in tertiary recovery techniques, then the Bill needs to be clarified to accomplish that result. Otherwise, Section 41 of the Internal Revenue Code defines research in the laboratory or experimental sense and excludes any research conducted after the beginning of commercial production. In experimenting with enhanced recovery techniques, it is necessary to apply such techniques in the field in the commercial production activity.

We hope that our comments will prove to be helpful to you in your deliberations on this important legislation, and we would be pleased if you would make this letter

a part of the record in the Committee's hearings on this subject. We would be pleased to provide any further comments or assistance which you may desire.

Very truly yours,

ROBERT B. HUGHES, *Director of Taxes.*

STATEMENT OF UNION OIL COMPANY OF CALIFORNIA (UNOCAL)

Union Oil Company of California (Unocal) offers the following comments on enhanced oil and gas recovery incentives to the Committee on Finance. Unocal is an integrated earth resources company engaged in all aspects of energy production.

Imports for the first of this year have averaged 45 percent of demand and they are expected exceed 50 percent in a few years. The stage is being set for the next energy crisis. We support Senate bill 828 and feel it should be a part of a national energy policy.

U.S. oil production is declining rapidly. It has already fallen from a 9.0 million barrel per day (MMBPD) peak in 1985 to an 8.1 MMBPD average for the first half of this year. And, according to the DOE/EIA Annual Energy Outlook, it is expected to continue to decline to 5.2 MMBPD by the year 2000.

Its not likely we can halt the decline, but we can and should do more to slow it down. This means adding new reserves to our domestic reserve base. There are three ways to add reserves: new discoveries, extension of existing fields and enhanced recovery techniques.

The first, new discoveries, is becoming less and less of an option. The U.S. is a mature oil province; it has been extensively explored and most of the very large fields, or the "elephants" as they are called in the industry, have already been found. Also, the nation's most prospective frontier exploration areas, the outer continental shelf and northern Alaska, are presently under intense debate and scrutiny by Congress and the Administration.

This means that extensions of existing fields and enhanced recovery techniques will play increasing roles in future reserve additions. In Texas 90 percent of the reserve additions in the last 15 years were derived from existing fields rather than from new ones.

Unocal is applying enhanced oil recovery (EOR) methods, on a rather large scale, but only in situations where economics are favorable at today's relatively low oil prices. For example, thermal recovery techniques are responsible for about 40 percent of the crude oil Unocal currently produces in California. In addition, we have large scale field applications of polymer flooding in the Dos Cuadras field offshore California and CO2 flooding in the Dollarhide field in West Texas.

Unfortunately, EOR projects require a substantial long term commitment of funds which is extremely difficult to justify with today's volatile oil prices. Our California thermal projects (steam floods) cannot be temporarily shut down when oil prices fall. If a project is shut down and the steam in the reservoir condenses, then permanent damage is caused to the reservoir.

Thus, when prices are low, we are between the proverbial rock and a hard place. We have kept several money losing projects going because of our faith in the future, but that experience has tempered our appetite for new projects in the current environment.

Yet, the resource is there. When primary recovery from an oil field is completed only about 25 percent of the original oil in place (OO1P) has been recovered. A successful waterflood can increase recovery to something on the order of 40 percent. Today, most fields are abandoned after they have been produced to a secondary economic limit.

Primary recoveries in California heavy crude oil fields are typically only about IS percent and these fields do not respond to secondary recovery. In fields where we have instituted thermal projects we are anticipating recoveries on the order of 40 percent.

Thus, enhanced oil recovery has the potential to substantially increase the resource base in this country.

Senator Domenici's bill to provide tax incentives for enhanced oil recoveries is a well conceived bill—it would have a substantial impact on oil production and a minimal revenue impact. Tertiary oil recovery accounts for a relatively small fraction of the oil produced in this country so the direct cost of the proposed incentives would be relatively low. These costs would be largely offset by increased employment and orders for capital goods and would be accompanied by an improvement in the balance of trade.

As much as we support the bill, there are two amendments we would like to propose.

• The 100 percent net income test, while a substantial improvement over the old 50 percent net income test, would remain a severe test for marginally attractive EOR projects. Depreciation of invested capital will keep project income low in the early years and will cause the net income test to severely limit the potential benefits of the proposed depletion allowance. We believe that the legislative intent would be best served either by eliminating the net income test altogether or by allowing depletion for the life of a project.

• The industry needs clearly defined EOR benefit periods for planning purposes. It would be better if the bill clearly specified these periods rather than granted the Secretary discretionary powers to to set (and possibly revise) them. Since marginally economic EOR projects necessarily have long payout periods, the depletion should be allowed for relatively long periods. Restricting the depletion allowance to shorter periods would add little economic incentive to marginal projects. Thus, we believe the depletion allowance should be granted for the life of qualifying projects.

We hope that the Committee will consider these points, but we want to make it clear that this proposal has Unocal's full support. Thank you for the opportunity to comment on this issue which is so vital to our national security.

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